DOCUMENT RESUME

ED 317 396	SE 051 305

TITLE	Task Force on Women, Minorities and the Handicapped in Science and Technology: Public Hearing. Report of the Proceedings (Kansas City, Missouri, December 1, 1987).
INSTITUTION	Task Force on Women, Minorities, and the Handicapped in Science and Technology, Washington, DC.
PUB DATE	87
NOTE	298p.; For the final report, see "Changing America: The New Face of Science and Engineering," SE 051 294.
PUB TYPE	Legal/Legislative/Regulatory Materials (090) -- Reports - Descriptive (141)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Access to Education; College Science; *Disabilities; Elementary School Science; Elementary Secondary Education; *Engineering Education; Equal Education; *Females; Government Role; Higher Education; *Minority Groups; Science and Society; *Science Education; Secondary School Science; Technological Advancement; Technology
IDENTIFIERS	*Task Force on Women Minorities Handicapped

ABSTRACT

The Task Force on Women, Minorities, and the Handicapped in Science and Technology was established by the U.S. Congress in Public Law 99-383 with the purpose of developing a long-range plan for broadening participation in science and engineering. Public hearings were held in Albuquerque (New Mexico), Atlanta (Georgia), Baltimore (Maryland), Boston (Massachusetts), Chicago (Illinois), Kansas City (Missouri), and Los Angeles (California) between Fall 1987 and Spring 1988. The final report of the task force was produced in December, 1989. This document is the verbatim transcript of the closed session and public hearing. Co-Chairs Mr. Jaime Oaxaca and Dr. Ann Reynolds presided over the meeting and hearing. The document includes a statement by Mr. John McKelvey, and reports of the social aspects, employment, higher education, and pre-college education subcommittees. Speakers at this hearing included: (1) Ms. Joann Platt; (2) Dr. Diana G. Helsel; (3) Mr. Tom Cummings; (4) Mr. Douglas Juarez; (5) Ms. Dawn Cunningham; (6) Ms. Karen Hummel; (7) Dr. Edith Jones; (8) Mr. John McTague; (9) Mr. Nate Thomas; (10) Dr. Patricia McCorquodale; (11) Mr. Jose de Jesus Esteban; (12) Ms. Cheryl Fisher; (13) Dr. Charles Rankin; (14) Dr. Manuel Berriozabal; (15) Dr. Gene Hampton; (16) Dr. Walter Smith; (17) Dr. Jerry Kollros; and (18) Dr. Don Ahshapanek; (19) Dr Elizabeth Applebaum; (20) Ms. Ruth Margolin; and (21) Dr. Joseph Estrada. A closed discussion of the task force focused on plans for the California meeting. (CW)

****
*   Reproductions supplied by EDRS are the best that can be made   *
*   from the original document.   *
****

ED317396

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

TASK FORCE ON WOMEN, MINORITIES, AND THE HANDICAPPED IN SCIENCE AND TECHNOLOGY

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sue Kemnitzer

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PUBLIC HEARING

December 1, 1987

The Midwest Research Institute
Mag Conference Center
425 Volker Boulevard
Kansas City, Missouri

SE051305

Transcribed by: ABL Associates
2254 Hall Place, N.W.
Washington, DC 20007

(202) 337-4609

BEST COPY AVAILABLE

INDEX

CLOSED SESSION

I. Dr. Reynolds - Welcome . . . 3
II. Mr. John McKelvey, CEO of MRI . . . 3
III. Dr. Clive - Social Aspects Subcommittee . . . 7
IV. Mr. Thomas - Employment Subcommittee . . . 9
V. Dr. Danek - Higher Education Subcommittee . . . 42
VI. Ms. Kemnitzer - Pre-College Education Subcommittee . 60

PUBLIC HEARING

I. Ms. Joann Platt, Administrative Assistant to Missouri Governor John Ashcroft . . . 66
II. Dr. Diana G. Helsel, Associate Dean, College of Agriculture, U. of Missouri-Columbia . . . 72
III. Mr. Tom Cummings, Associate Director, MACESA . . . 85
IV. Mr. Douglas Juarez, Member of MACESA . . . 85
V. Ms. Dawn Cunningham, Member of MACESA . . . 87
VI. Ms. Karen Hummel, Director, MACESA . . . 88
VII. Dr. Edith Jones, Past President, National Medical Association . . . 97
VIII. Mr. John McTague, VP-Research, Ford Motor Co. . . 106
IX. Mr. Nate Thomas, NAMEPA . . . 124
X. Dr. Patricia McCorquodale, Associate Professor, Sociology, U. of Arizona . . . 144
XI. Mr. Jose de Jesus Esteban, Computer Programmer, National Weather Service . . . 163
XII. Ms. Cheryl Fisher, Teacher, Parkview High School, Springfield, Missouri . . . 165
XIII. Dr. Charles Rankin, Kansas State U. . . . 170
XIV. Dr. Manuel Berriozabal, Professor, Mathematics, U. of Texas, San Antonio . . . 177
XV. Dr. Gene Hampton, Executive Director, Science Pioneers, Kansas City . . . 192
XVI. Dr. Walter Smith, U. of Kansas and COMETS . . . 202
XVII. Dr. Jerry Kollros, U. of Iowa . . . 215
XVIII. Dr. Don Ahshapanek, Haskell Indian Junior College 223
XIX. Dr. Elizabeth Applebaum . . . 242
XX. Ms. Ruth Margolin, Director, Women's Center, U. of Missouri, Kansas City . . . 244
XXI. Dr. Joseph Estrada, Office of Regional Director, U.S. Dept. of Health and Human Services . . . 249

CLOSED SESSION

Task Force Discussion . . . 253

DR. REYNOLDS: We should start because all of you have been so good about getting up so early in the morning. I want to have it turn out to have been a useful thing to do.

I welcome you all. It is good to see you. One of the best things about being on this task force is now that many of us are becoming fast friends, I can see us some years from now having annual reunions, at seven o'clock in the morning in some remote place served only by Braniff Airlines.

I want to thank the Midwest Research Institute for hosting the meeting. We have with us this morning President John McKelvey, who is the Chief Executive Officer of the Research Institute. Mr. McKelvey has roots back in California, having served at the Stanford Research Institute in Menlo Park, California before coming here in 1964. Mr. McKelvey.

MR. McKELVEY: I also went to Stanford, so I have a long history in California. On behalf of the staff and the Board of Directors of MRI, we really are pleased to welcome you all here today, and I hope the facilities and all work well for you.

As a research organization, we certainly endorse your efforts to broaden the participation in the sciences because obviously it is not only important to us as a research organization, but also to the entire country.

I am sorry that I will not be able to attend your session. I am catching a flight this morning back to Washington. You might be interested in the project we are involved in and I am going back to Washington on. It is for NASA and it involves determining the economic impact on our gross national product of investment in research and development.

In other words, does the dollar in R&D have a payoff in terms of an increase in GNP?

Dr. Solla [PHONETIC] who recently was awarded the Nobel Prize for economics, one of his main theses is that this is indeed the case. MRI did a study for NASA back in 1970 and '71 demonstrating this principle and we have been asked to update that study.

So the work you are doing, in terms of the importance of the scientific area relates definitely to this project we are currently involved in. I do think it is appropriate for your group to be meeting here because we, as I said, obviously have a strong vested interest in the sciences.

We are an independent not-for-profit contract research organization and essentially work for both the public and the private sector. And in this way, we are very much concerned with achieving the best possible results for our clients at obviously the lowest and most competitive cost.

And if we are going to do this, this means that we have to really attract the best possible people and that means looking at representatives of all elements of our population if we are going to be truly successful.

We are pleased--in this regard, we are please, for example, that women account for 42 percent of the total staff here at the Institute, and 35 percent of our management and technical staff.

The highest ranked scientist at the Institute is a woman, and four of our 13 department directors are women.

Unfortunately, in our employment of minorities in the technical area, we have not been quite as successful. We have been working very hard to remedy this and we have an accelerated program of minority recruitment, targeting on colleges and universities with a predominant minority enrollment.

But our major problem in this area seems to be the really limited number of minority students who are interested and involved in the areas of sciences that are most important to us, and that is, namely, biology and chemistry.

MRI is principally involved in environmental and health research here in Kansas City. We also operate the Solar Research Institute for the Department of Energy out in Golden, Colorado.

But here in Kansas City, we are mainly in environmental and health research, and that requires people in biology and chemistry.

We think one solution to our problem in recruitment is to gain greater interest in these scientific fields among students in high school. And that is why MRI, from its very beginning, has always been a strong supporter of such groups as

Science Pioneers here in Kansas City.

And I understand that Dr. Gene Hampton, who is Executive Director of Science Pioneers here in Kansas City, will be talking to you later on, and I think he will have more to say about that particular area.

I really do believe that the mandate given to your task force is of great importance to the country. If our young people can't be attracted to the technical fields at an early age and be helped and encouraged to develop their skills through the continuing education of the future, we are never going to be able to develop this pool of scientific talent that we desperately need in this country, and we really do need this pool.

I wish you very much success in your efforts today and in your future meetings. You really do have a difficult assignment and I hope that if we could be of further assistance here, you will let us know.

I believe that you know Mrs. O'Keefe, Mrs. Greta O'Keefe, who is Director of our Communications Department, and Greta will be your host in making certain that things work well for you today. Thank you and we appreciate your coming here. [Applause]

DR. REYNOLDS: I would like to move on--thank you very much, Mr. McKelvey, and hope you have a successful trip to Washington.

MR. McKELVEY: Thank you.

DR. REYNOLDS: I would like to move on then to the report of the subcommittee co-chairs, beginning with the Social Aspects Subcommittee. Dr. Clive.

DR. CLIVE: I wished that we had been able to convene a meeting of our group, but I gather we didn't have enough [INAUDIBLE] last month to do that. We haven't made much progress, I'm sorry to say. Claire and I have discussed a possible approaches.

We have done some thinking out loud that the co-chair meetings that have been held in Washington [INAUDIBLE]. Basically what we are thinking about are the kinds of recommendations that will allow for changes that will take a while to implement, but that after all is--a committee that is supposed to be able to underline social factors that created our situation--those social factors are not going to change overnight or even in a short period of time.

So we have been thinking about those items that are going to take a while. In fact on [INAUDIBLE] and so on. The problem is that, while on one hand, those factors are really fairly obvious, we all know what they are.

On the other hand, it is difficult to come up with useful suggestions for their alleviation. We are also looking--and we might find some here in Kansas City--looking for recommendations from witnesses [INAUDIBLE] about attacking these underlying vestiges of--we have heard a lot about exemplary interventions, but not enough about things that really have a long-term effect.

I think there is one other thing that I hope to pursue over the next couple of months is that we can get some funding from DOD on a consultant basis. I would like to see us bring some deep thinkers--I don't from where exactly--but just as some of the other subcommittees are trying to draw on expertise in their areas.

I would like to see some social thinkers sit down with us for some hours and give us the benefit of their thoughts on what approaches might be taken.

So I am afraid right now we have not [INAUDIBLE] all that I would wish, but as we knew at the outset, ours was perhaps [INAUDIBLE] assignments.

DR. REYNOLDS: Any comments or questions?

MR. OAXACA: Do you have any timetable? It would appear that one of the things that we might want to discuss after we have all the reports in is the first cut that...

DR. REYNOLDS: At some kind of timetable, I agree [INAUDIBLE].

DR. CLIVE: We have talked about at the last co-chairs meeting about that we [INAUDIBLE--interfering noises] a report that will be [INAUDIBLE].

DR. REYNOLDS: I was going to suggest that perhaps we should have some kind of preliminary set of recommendations--they might not even be the final ones that each committee would go with--in time for the California meeting. A one-page set of recommendations for the rest of the group at least that has something as to how the committees are moving.

Would that be agreeable?

DR. CLUTTER: I can't hear because there is some interference from some electronic something or other.

DR. REYNOLDS: OK. We were saying that perhaps it is time on the work of the subcommittees to have a deadline, and I was proposing California in January, not a finished draft, but perhaps a one or two page set of tentative recommendations or directions that the committee work is taking for each committee.

And I see heads nodding, so perhaps we will aim for that. Is that all right with you, Jaime?

MR. OAXACA: Sure, I think...

MS. WINKLER: Well, when is the California meeting?

DR. REYNOLDS: We are still struggling. We are working very hard to get the governor there. It is probably going to be in mid-January.

MS. WINKLER: Mid-January.

DR. REYNOLDS: Yeah. OK, let's move on then to assignment. Ms. Guerra, Mr. Thomas, you're going to give your report?

MR. THOMAS: She's not here now, yes. First of all, this morning we have four members of our subcommittee here today. And we met three times and we haven't established a working outline for some reason. What was a part of a working draft by [INAUDIBLE].

We have defined what we call a methodology, and some of the things that we plan to do is to examine the [INAUDIBLE], at least through any occupational areas. I will give you the data bases for potential aggregates, the aggregate component in acquiring an occupation as a part of populations.

[INAUDIBLE] of nonfederal entities that could be used to promote employment. I then called organizations who are working on the same problem, and in terms of ability to establish partnerships. [INAUDIBLE] to determine what programs are in place from the vantage of the agencies involved.

But from the working outline, recognizing that each of the [INAUDIBLE], we have established six catgories, the first being: examine current situations and identify the problem±

Second is, identify those concerns asssociated with the current situation and subsequent to that, identify a policy implication of the current trend.

Third, develop short- and long-range plans to advance opportunities.

Fourth, provide [INAUDIBLE] or results.

Five, recommendations--recommendations falling under two areas, short-term and long-term, and [INAUDIBLE].

And last, which we can [INAUDIBLE] to our recommendations would be to assess the progress, and by that, develop and/or identify [INAUDIBLE] mechanisms for assessing power, recommendations [INAUDIBLE].

We also have to set a set of next steps, and I can read some to you [INAUDIBLE]. The combination steps we have, that are indicated for--we shouldn't produce a target, because a target [INAUDIBLE] by the 21st of this month.

We would need to get some additional data from OPM and other agencies. We need data on all aspects of [INAUDIBLE] and engineering to improve the educational opportunities, degrees, payment [INAUDIBLE], employment opportunities, and opportunities for promotion.

[NOTE: There are many noises in the room--sqeaking chairs and doors, coughing, keyboard noises, paper shuffling, etc.--that are causing some of the speaker's words to be missed.]

Thus far, we have found a nonexistence of such data. But [INAUDIBLE] improve the opportunities. And we want to set a meeting with the Equal Employment Opportunity Commission.

Last night Sue gave some input which I think are very key to some of the things that they want to do. And I won't read these, but included in that is, perhaps a meeting, too, [INAUDIBLE]of the Equal Employment Opportunity Commission to speak to the subcommittee about what the present laws and administrative policies are.

And that would fit into what we have as one of our subheadings, that is, to determine the policy of education, the current trend, as it is.

Now, at our meeting in October, we got some data that [INAUDIBLE] better, and I will just cite some of that, the key things.

Some data thus far suggests that women are an increasing proportion of the science and engineering labor force in every field since the early 1970s, but the rate of increase started to level off as early as 1981 and the actual increase also has slowed.

Now their employment rates are from two to five times as high as for men in the same field at the same degree level, and this is also supported by documentation of second sector of Brock's paper.

Additionally, for most science and engineering occupations, women typically are about two to 2.5 grades below men, but published data did not [INAUDIBLE] by that time, and a conversation with OPM, by one of our people from OPM, also supported that.

Blacks are 2.4 percent of all employed in sciences and engineerings, Hispanics 2.5 percent, native Americans .8 percent, Asians 5.8 percent, and this is data collected from the National Science Foundation.

The doctoral labor force in science and engineering includes less than 50 percent women, and they are generally younger than men.

Blacks are 1.4 percent, Hispanics 1.5, native Americans .1 percent, Asians 8.6 of the doctoral labor force, and more than 9 percent of the Asian are foreign-born.

Among the 1985 [INAUDIBLE] graduates in science and engineering who are in the labor force one year later, about 38 percent are women, 3.3 percent are black, 2.7 percent Hispanic, .3 percent native American, 3.8 percent Asian.

Again, based upon all the trend data, all of this essentially suggests there is a problem with--in fact, the percentages are similar. All available data tell us that women and all minority groups are underrepresented in the science and engineering labor force, which we know, and relative to their proportional share of the population.

Now a point to be made that our subcommittee has made, and which could be controversial, and we don't any data yet that will support this necessarily, but the lack of minority representation is not necessarily due to the lack of, or inability, but due to lack of preparation, encouragement, funding, and role models.

We have some data from DOD which represents the federal work force as well, and this is a profile of the American work force, and I will just read certain aspects of this.

The the next 13 years the work force and the economy will be shaped [INAUDIBLE] according to the work force 2000. That is a growth in the population of the work force will decline by the year 2000, and the population growth will be slower than in any other time in the nation's history.

The average age in the work force will increase while the number of young workers in the work force will decline. The average age will rise from 28 years in 1970 to about 36 in the year 2000.

Women, minorities, and immigrants will make up the largest share of the new work force. Between 1985 and 2000, women will make up three-fifths of the labor work force, minorities and immigrants make up a large proportion of the rest.

Occupations will require greater educational levels.

All right, for the federal work force, the federal government's requirement for programs and people are expected to be similar to those in the private sector, in math, engineering, scientists, computer specialists, and other high-tech positions will be high.

In addition, the private sector must also be concerned about the impact of fiscal and budgetary policy on the work force. And we have some data there, I'll suggest that.

According to October '87 Department of Labor figures, the federal government employs over 2.9 million civilians and 1.7 military members annually. Of these, about 5.6 percent are disabled.

The Department of Defense and defense-related agencies make up the largest proportion of the federal work force. They [INAUDIBLE] about 61 percent of the people in the federal government work in defense-related agencies.

The federal work force is about 79 percent white collar, 21 percent blue collar. Employment in the science, engineering, and architectural areas are continually increasing. This increase has been consistent [INAUDIBLE] for defense research and deployment, and the data reflect the federal government employs the highest percents of blacks, Asians, and native Americans than the civilian labor force.

In recent years, the rate of women and Hispanics in the federal government has increased. Participation is up for all groups in professional and technology areas. While it is up, their small numbers are increasing.

Women and minorities are certainly found in agencies whose missions are not directly associated with science and technology. Again, a concern there.

How Asians and Americans hold comparable employment status and are certainly found in agencies, perhaps science and technological-related missions.

Large numbers of handicapped employments can be found at Defense, Health and Human Services, Treasury, U.S. Information Agency, U.S. Postal Service, and the Veterans Administration. And we have some charts and data to support that, we'll make a copy for you in terms of the members there.

But myself being a member of the federal work force, I hope that our big collection would indeed affect the future. And that is the end of our.

DR. REYNOLDS: Thank you very much. Questions? Comments? OK. We will keep going. Research support, Dr. Clutter.

DR. CLUTTER: Yeah, thank you. Our subcommittee has had one meeting in addition to the meetings we have held at hearings, and I wanted to report to you on that. But first I thought that I would tell you what we mean by research.

We have defined research to mean those programs at the federal level and in the private sector that support research projects, or research programs of women, minorities, and the disabled.

So what we don't mean are fellowship programs and other educational programs that might be related to research. And we don't mean employment of workers because those are part of the reports of other subcommittees.

So we are simply talking about research support and special programs that are available for women, minorities, and the disabled.

We have been collecting information, and I must say that we have fairly good data now from most agencies, but not from the private sector.

The kind of information that we have are programs that provide money for research, the amount of money that has been invested by agencies. We tried to get it broken up by major disciplines, but that has been more difficult.

We have tried to get information for fiscal years

'85, '86 and '87 and projected for '88. That is very incomplete.

We have tried to get gender and ethnic data for those years, but most agencies do not collect the information in that way. We have tried to collect data in intra as well as extramural support, and that is fairly difficult because I think that most agencies that have intramural research programs don't collect any kind of information in a way that is helpful to us.

And certainly there are very few programs, intramural programs, that are directed towards women, minorities, and the disabled. There are some for minorities, but not for women or the disabled.

I held a meeting in, I guess last month, on November 13th, my subcommittee held a meeting to review the procedures that are used for the selection of projects that are supported by the federal government, because it turns out that various of the agencies use very different methods for selection.

And what our objective was, was to determine whether there were any special review criteria that were used that might enhance participation. And by that, I don't mean that we were looking for criteria that would exempt our target groups from the general excellence criteria.

That wasn't what we had in mind. What we had in mind was seeing whether agencies paid any attention whatsoever to the fact that there were proposals from our target groups.

I think it will be useful to know how much support goes into research in colleges and universities because they are the major performers of research for the federal government--basic research, that is.

Because it is useful then to compare that with the kind of data that we collected. And 53 percent of the federal dollar is spent by HHS, 24 percent by the National Science Foundation, 10 percent by the Department of Defense--which parenthetically is rather shocking actually, when you think of their $7 billion R&D budget.

MS. KEMNITZER: They have 66 percent of the federal R&D budget.

DR. CLUTTER: And 10 percent goes into colleges.

MS. KEMNITZER: Ten percent of that 66 is only going to colleges.

DR. CLUTTER: That's right. OK, 5 percent from DOE, 4 percent from NASA, and 4 percent from the Department of Agriculture.

So with that in mind...

DR. REYNOLDS: Dr. Clutter, why is agriculture so low?

DR. CLUTTER: Because they have, most of their money goes into the ARS--the ARS is the Agriculture Research Service, and those are the federal labs, the national labs.

DR. REYNOLDS: So those don't count in that tally.

DR. CLUTTER: That's right. OK, well in that tally, the research that goes on at NIH, the intramural research, is not counted either.

DR. REYNOLDS: So even with all the big pressure to get more into competitive funding, they really haven't done it. Most of it is still going into this one...

DR. CLUTTER: Oh, well, the whole program is less than $40 million, and it has been the same for--ever since its inception, the research grants project, and it began in fiscal year 1977.

DR. REYNOLDS: When the pressure was to get it more--it has an increase?

DR. CLUTTER: No, it has been flat dollars, and in fact it has decreased in [INAUDIBLE] dollars.

DR. REYNOLDS: That came up out of--that's too bad.

DR. CLUTTER: So that is what we are dealing with.

MS. BISHOP: Did you check with all the other agencies around, of those of us who are sitting here? Or you just hit those?

DR. CLUTTER: I just took available data, and the other agencies are negligible. They are below 4 percent.

MS. BISHOP: No, I believe you. I just wanted to know if you have even called the other agencies, you know, like mine.

DR. CLUTTER: Which is yours?

MS. BISHOP: EPA.

DR. CLUTTER: Yes, I do have EPA data, but I didn't bring it with me. But it is very, very low.

MS. BISHOP: Oh, I'm sure it is.

DR. CLUTTER: Going to colleges and universities, because EPA doesn't really have big research programs.

MS. BISHOP: No, no they don't.

DR. REYNOLDS: Energy percentage that went to universities, please?

DR. CLUTTER: Five percent. Now this isn't five percent of their dollars. It is of the federal investment.

DR. REYNOLDS: Of the university research enterprise.

DR. CLUTTER: Which is somewhere around $5 billion.

DR. DANEK: Which is just for research, not for education and training.

DR. CLUTTER: No, I'm, we're, this is the research subcommittee.

DR. REYNOLDS: We understand.

DR. CLUTTER: So with that in mind, we wanted to know what review procedures are used and how projects are selected, and so we invited representatives from the various agencies to talk about that. And as you might expect, the two big users of peer review are NSF and NIH, and their review procedures are fairly similar.

They make very special efforts to include women and minorities and disabled on all of the review committees. And we talked about the difficulty in identifying especially disabled persons.

But we do take extraordinary measures, and in fact Ruth Kirschstein, who is on the subcommittee, who testified for NIH, talked about how there is a lot of criticism now that peers may not be peer reviewing because they are--I mean this is a criticism from the establishment, I must say, because they are getting concerned that NIH is including too many of the other performers, meaning other than white male.

OK, but that's aside. But another concern is that the...

MS. BISHOP: Excuse me, I just wanted to make sure I heard you right.

DR. CLUTTER: Yes.

MS. BISHOP: These committees that review research proposals at NIH and...

DR. CLUTTER: NSF.

MS. BISHOP: Do have minorities...

DR. CLUTTER: Oh, yes.

MS. BISHOP: Sitting on the committees.

DR. REYNOLDS: Yes, they do. I have served on them.

MS. BISHOP: But there is still this concern that we don't have enough of the other, white males? Is that what you are saying?

DR. REYNOLDS: Their peers. There is a concern that to be peer reviewed, it ought to truly be peers. And since such an effort has been made to include women and minorities, that it is not truly peer review any more, because the scientific research establishment is so dominantly white male.

DR. CLUTTER: I have heard this myself on more one occasion.

DR. REYNOLDS: I just have to say, editorial comment. I had a previous life as a research scientist and served--and chaired, ultimately, a study section for NIH. It was a heavily traveling one because it was for the Primate Research Centers. So we were like a band of gypsies, going around the country, writing proposals standing in airport lines or driving around Lake Pontchartrain and things like that.

And this group had a black person, a woman, and so forth. And frankly, it was the black person and the woman and I that wrote all of the views. Our standard joke was the neuropsychiatrist, always which was a white male, who never even realized what the group was that we were reviewing, never even came to grips with the whole situation.

It was just a standard joke.

DR. CLUTTER: OK, well I'll go on. One of the concerns that was brought up is that minorities are in such short supply--it's not just that we can't find excellent people, but they are in such short supply, and that was certainly demonstrated by the data about how many are available, that they are used over and over.

DR. REYNOLDS: That's true.

DR. CLUTTER: And agencies actually compete for available minorities to take part in this process.

And some people think that it might even be detrimental to the careers of some of these people because they are spending too darn much time reviewing and not enough time doing research.

Now the same thing has also been said about women. Women of very high visibility--meaning women who have professorial positions--are used over and over and over. But that is because there are very few women in professorial positions. But there are lots of women in the work force.

But when NIH and--not so much NSF--NIH is taking most of the criticism because they have more of the dollars, I guess.

MS. BISHOP: I know NIH, the attitude.

DR. CLUTTER: They say that they are being criticized for using women on their committees that are not of the same quality, but that gets back to our previous comments.

I have talked about the difficulty in identifying the disabled. One other thing about the peer review system is that it is not used by and large by other agencies, other than NSF and NIH.

It is used--the Department of Defense person who testified said that they have so much in-house expertise that they don't really think they need to have peer review. They use it when they need it, when they need to supplement their in-house expertise.

MS BISHOP: So, if they have some money to give you, it is a review by one person?

DR. CLUTTER: Oh, I don't know how many people actually do the review. It is an internal committee of some sort, I guess.

But anyway, they don't use peer review, to any great extent.

MS. KEMNITZER: So, Mary, is it fair to say that their review, in-house, is done by people that more or less mirror their general employment profile? In other words, we could expect that there would be very few women and minorities involved in the internal review process?

DR. CLUTTER: In fact, they are somewhat concerned about that because I have had some recent conversations with one Colonel Entley [PHONETIC], who is trying to recruit me to be on one of their committees.

?: Here we go again, wearing one person out.

?: Don't go, Mary, don't go. Wait until your subcommittee report is done.

DR. CLUTTER: OK, the Department of Energy uses peer review for some of their programs, but certainly not all of them.

So I think that in making selections of research projects, mostly it is done by in-house people, so we would expect that there wouldn't be many women, minorities, or disabled involved in the selection.

And in fact, the Department of Energy said that it is placing less emphasis on women these days.

And one other point that escapes me right at the moment--oh, yes, one important thing that the Department of Energy does have a person, or a number of people they call ombudsmen, whose business it is to go out into the community to try to identify women, minorities, and disabled researchers.

And when they do they try to give them assistance in developing research proposals, and they track those research proposals once they are submitted to DOE, and they track them up to the point of review, but after that, [INAUDIBLE]

OK, there were a number of issues that we brought up at the end of our session, and one is the business of competing for the same population of minority scientists.

Another is an overlap in programs of--and a number of the programs of federal agencies. And we wanted to address gaps that might exist between programs. So we have a number of recommendations at this point.

Number one, better data are needed. We think that some of the data just don't exist in any usable form right now, and so we want to recommend that better data be collected in a more systematic fashion, and we think that better coordination is needed among agencies.

Secondly, there are quite a number of minorities programs. I think every agency has one of these programs. But if they've never been evaluated.

And so we would like to recommend evaluation of those programs. We are concerned about the overlap among some of the agencies. We are also concerned that some agencies just put these programs aside and say, well, we need to do this and so we are going to do it, but really don't do much that is very constructive with it.

Yeah, you had a comment.

MS. BISHOP: Yeah, you just might want to look at some of the agencies and ask the question whether of or not they had any programs or set-aside money for minorities.

I am speaking of my own agency, where in the research program we had a program called [INAUDIBLE], which was less than a million dollars, as I recall. That was set-aside, earmarked for minority institutes.

And that was considered seed money, first year, or maybe even second-year funding, to get them started so that if they wish to continue the project, then they would be presumably on a competitive basis with everybody else and all day in the universities.

And that was seed money that was set aside. They had it, and it was wiped out of the budget, and because I left research development, I don't know why, so I am bringing this up to say that perhaps in your...

DR. CLUTTER: I wonder if you could help us?

MS. BISHOP: You may want to ask whether any of the agencies had at one time these set-aside programs, and if so, why are they no longer with us. Because I think you will find that there are--you had a lot more in the early '80s and late '70s...

DR. CLUTTER: That's right.

MS. BISHOP: Than you do now.

DR. CLUTTER: Well, one of our recommendations is that we also take a look at some programs that no longer exist or programs that have failed, if we can identify them. Not only do we want to identify exemplary programs, but perhaps a program that failed and see why.

The next recommendation is that we need a timetable for mainstreaming some of these programs. Most agencies do--in fact, all agencies do not have such a timetable, and we are working on that now at NSF.

MS. BISHOP: What do you mean by mainstreaming?

DR. CLUTTER: Well...

MS. BISHOP: Bring them into competitiveness?

DR. CLUTTER: Yeah, of competitive programs.

MS. BISHOP: OK. That's what EPA's program was...

DR. CLUTTER: Yeah, right, maybe they think they have mainstreamed it. But we--what we are doing at NSF now is trying to arrive at some criteria for success, because we don't want to mainstream things before they are deemed a success.

Of course, we can always declare a success, I guess.

Finally, we feel that we need more testimony from recipients from some of these special program awards, some of these minority research initiations, some of the women's programs at NSF, and we haven't heard from them yet.

Thank you.

DR. REYNOLDS: Thank you, Dr. Clutter. Any other questions or comments for Dr. Clutter. Yes.

MR. FERNANDEZ: Well, I think you don't agree, but see if you do, as far as total federal dollars that go into research in universities.

A couple of things. I don't know if you have got data, but it seems like a lot of these research dollars are going into Ph.D. type programs, and I think one of the biggest [INAUDIBLE] we have for minorities is in getting money for graduate assistance in master's programs. And that's the pipeline that leads eventually to the Ph.D. programs.

And I don't know how many grants in this type of dollar is going down to those areas.

DR. CLUTTER: OK, now we are only reporting on basic research dollars. The education dollars are something different.

DR. DANEK: I am going to address that.

DR. CLUTTER: Now I know on grants there are research assistants, and those would be part of the...

MR. FERNANDEZ: But one of the biggest problems in the universities today is that a lot of these monies come in on an individual basis as grants, research grants, and there are mentors there that distribute, dole out the money. And they are not getting to women and minorities. The other thing I want to...

DR. CLUTTER: May I just answer that just briefly. Yes, that is a problem, and we started--this is just at NSF--we started a program several years ago in which we offered supplements to research awards to people who had minority students.

This was only available for minority students. It has been extended in engineering to include women students.

MR. FERNANDEZ: Well, what I was going to say is that I think we have a bigger problem than just the peer review and solving the grant problem.

I have talked so, university presidents, and it seems like it goes against the grain of faculty to even think of team type research dollars, and the low percentage from DOE and DOD might be a poor problem with how they allocate research dollars to anybody.

The bulk of the DOD dollars go out on big contracts to big companies who then have subs and they do all the research within that network. But they don't put too much money into the institutions because they don't have big team efforts.

And the dollars that do go into those institutions are probably on a one-to-one consultant basis, with a few exceptions.

And therefore, again, if you have only one-on-one grants, it is very difficult for the minorities and women to get into those programs.

So I think you have a very basic structural problem on how DOD dollars and DOE dollars are being put out for research purposes, and if it is only--what did you say five percent for DOE?

DR. CLUTTER: Yes.

MR. HERNANDEZ: And 10 percent of defense?

DR. CLUTTER: Yes.

MR. HERNANDEZ: That is a real huge problem, I think.

DR. CLUTTER: I'm sorry, I'm missing what your point is. Could you try me again on this?

MR. HERNANDEZ: OK, we are focusing in on research activities, dollars from the federal government that go to universities.

DR. CLUTTER: Go into individual universities.

MR. HERNANDEZ: It seems to me like you have already got a bottleneck here that, with the exception of human services, all the other departments are putting very little money into the universities for research, and the money that is going there is on a grant basis, a one-to-one basis, that is not getting to women and minorities, with very small numbers.

DR. REYNOLDS: On the first point, I think Dr. Clutter's numbers are fascinating there, and I think we would register dismay, for example, that such a small proportion of DOD dollars are going to universities for research.

And I think that is probably going to be highlighted, you are going to include that in your subcommittee report.

In other words, the majority of the dollars going to core research right now are coming out of NIH and NSF to universities.

MR. THOMAS: Universities and other agencies. But other than that...

DR. REYNOLDS: Yeah, but the majority of dollars going to universities are coming out of--are coming from NIH and NSF.

MR. THOMAS: That's a function of the budget, because when the budgets are cut, the prime, the first target is the R&D dollars.

DR. REYNOLDS: Yeah, but, excuse me, I'm just trying to respond to Dr. Hernandez's concerns, and I wanted to make sure the group caught that, I think there was group feeling that the, that some agencies are not in the framework enough with universities. I think that is a valid point.

Now, I want to understand your second point.

MR. FERNANDEZ: The second point is I think we have a basic philosophical problem on how these federal dollars are being doled out on a grant basis.

DR. REYNOLDS: All right, now explain what the concern is there.

MR. FERNANDEZ: That it seems like the research community that are dealing with these dollars have accepted the bottom-line basic premise that it is a one-to-one based grant to individuals with peer review as a criteria to determine whether it is good or bad, which is evidently not working too well.

DR. REYNOLDS: That is true in universities.

MR. FERNANDEZ: But the research dollars are going now--DOD, DOE and other major departments--are going now for specific objectives that that research can contribute to, and you wind up with a big contract with teams of researchers doing the job.

DR. REYNOLDS: Now you are talking about nonuniversity research.

MR. FERNANDEZ: Well, any kind of research. But university research now has a basic philosophical problem that they have accepted the premise that good research dollars come in on a one-to-one basis.

DR. REYNOLDS: That's correct.

MR. FERNANDEZ: And that you are not keeping in line to what is going on in the front [INAUDIBLE] in other agencies where you do team research. And big dollars come in for the university, you set up a team that includes a lot of minorities and women on that team to do the research, both at the master's level and the Ph.D. level.

And you come out with a greater output.

DR. REYNOLDS: I'm not sure that we have the data on that second one to answer it. I would be interested in what Dr. Clutter says. I am not sure that the team research that

DOE sponsors at major labs--we saw an example of that at the hearings in Chicago when they were reporting on some of the major labs.

They have fewer minorities and women on those research teams than they do in universities.

MS. KEMNITZER: That's correct. In fact, this move toward the big project teams gives great concern to some people because they feel that women and minorities will have less chance to participate in those than they will in the individual research projects.

MR. FERNANDEZ: I'm not giving you an answer. I'm just suggesting the basic philosophical problem here and how we've done it forever now.

DR. REYNOLDS: I think the opposite is true. I think--I agree with you that there is a difference, but I think the difference has worked the opposite way.

MR. FERNANDEZ: Well, I am not sure that is true, because in some of the federal agencies, excuse me, in the R&D areas, we have made a lot of headway in getting minorities and women on those research teams.

DR. CLUTTER: But do they lead the teams.

MR. FERNANDEZ: Pardon me?

DR. CLUTTER: Do they lead the teams, or are they just part of the work force?

DR. REYNOLDS: And the problem is the data that has been presented to this group thus far are the opposite.

Remember--you were at the Chicago hearings.

MR. FERNANDEZ: Are the opposite of what?

DR. REYNOLDS: They are the opposite of what you are suggesting. The data from Argonne and Fermi were just the opposite.

MR. FERNANDEZ: But in the national labs, right. I am talking about the federal agencies, not the national labs.

DR. REYNOLDS: Well, those are federal, national labs, with most of their support...

MR. FERNANDEZ: Well, they are federal national labs but they are not...

DR. REYNOLDS: Those are the kinds of monies that Dr. Clutter is talking about.

MR. FERNANDEZ: But they are not controlled like federal agencies as far as hiring, affirmative action.

DR. REYNOLDS: Well, sure they are.

MR. FERNANDEZ: Well, they are supposed to, but they are not doing it.

DR. REYNOLDS: Well, they are getting a large amount of those DOD and DOE dollars that Dr.Clutter is referring to, that are not present in her analysis because they are not going to universities.

MR. FERNANDEZ: Well, I think we have got problems on both sides, but I am just suggesting that we are going to have to look at how we dole out the federal dollars if this is in fact a true picture.

Ten percent, five percent versus 50 percent, something is wrong someplace.

DR. CLUTTER: Yes, I will agree with that.

DR. REYNOLDS: Yeah, we will all agree with that.

DR. ADAMS: Oh, well, I was thinking you were hitting on another point that I had, a concern that I have had for a long time dealing with graduate education. If you look at the places where people who get Ph.D.s in the sciences get their support from, it does not come from research dollars in the university, if you are talking about minorities and women.

And that's backed up by the National Science Foundation studies that they do, Research Council studies that they do every year.

Their money is much more on fellowships which are portable and outside funding.

And so I have been arguing when you give monies to universities, we don't get it. OK, and I think that is a strong point I would want to make. In other words, if one of the ways in which we are going to fund Ph.D.s and master's level people is to give the money this way, we won't ever get that, because that is controlled by a professor who doesn't look on us with favor anyway.

So he is just not going to pick us on a research team. So I am concerned about that, and I thought that was a point that you were trying to make, if in fact--and I would be very concerned about that as a part of one of the questions that you asked, somewhere in that whole scenario.

DR. CLUTTER: OK, maybe I can talk to you later about that.

DR. ADAMS: Yeah, because...

DR. CLUTTER: I would like you to help me formulate that kind of question. It is hard to get at.

DR. ADAMS: I know that, but I am saying...

MS. KEMNITZER: That is a concern.

DR. ADAMS: Yeah, if we take the data that they come out with, all the data [INAUDIBLE], and I have been arguing about that. We have been drying up fellowship money, which has been portable. Like when you take something like GEEPA [PHONETIC], if you kill that which has funded minorities and women, and then you say we have got to go to the trough of regular research dollars, we're dead. We won't get any money.

DR. REYNOLDS: And that is an extremely important point to keep in mind because I think one of the things that is slowly emerging from the hearings and so forth, and from your question, and from what Dr. Clutter and what Mr. Hernandez were talking about, there has been a notion in some of the funding programs that one could cut out the million dollars aimed for minority and mainstream with the notion that things were going along well enough that this would do the job.

In point of fact, it has not happened. The elimination of the GEEPA funding has had the effect of suppressing the numbers of doctorates going to minorities. I think that's what...

MS. BISHOP: And in the absence of any hard fast requirement for monitoring...

DR. REYNOLDS: Or review of the...

MS. BISHOP: Or review, you are going to get things floating out there at the whim of some individual person, and not at any criteria aimed at monitoring how well you are doing what you think you are supposed to be doing.

DR. REYNOLDS: But I think that Mr. Fernandez does have a point, and I think one of our problems is data on that large flow of dollars from Department of Defense into R&D, nonuniversity R&D and the nature of the personnel there.

And I'm not--do we, are we covering that in any way? Can you put that down into a big question, because I think that...

MS. KEMNITZER: Sure. May I state the question in another fashion?

DR. REYNOLDS: Yes.

MS. KEMNITZER: That is, given that DOD employs most of the scientists and engineers and given DOD has most of the federal research dollars--I will even say it more directly than perhaps I should--shouldn't they be paying to develop the research base and the personnel?

DR. ADAMS: Good question.

?: I think that is an excellent question.

MS. KEMNITZER: That may be my last statement to the task force.

[Several inaudible comments]

DR. REYNOLDS: And you will make sure that we do not lose sight of that particular...

MS. BISHOP: I think that is a good question, they're always talking about developing your own.

MS. WINKLER: Could I say something?

DR. REYNOLDS: Yeah, surely, didn't mean to leave you out. Dr. Winkler.

MS. WINKLER: I am not a researcher--which raises another issue here on, one of the things the universities, especially the big research universities, say when the Department of Education has sort of gone after them on tuition increases.

And the response has been, "Knowledge isn't cheap, research costs lots of money, and tuition is paying for all this research."

One of the questions we may want to think about is the tuition goes up, we know that that makes it very tough, particularly on minority students, to raise the money to go to the top universities that charge the most money.

And now we are hearing that all this research money isn't benefitting them. It is benefitting researchers who are not minority researchers, not female researchers, not handicapped researchers.

There is an interesting interplay in the university world between who is supporting whom and who is paying for what, and I think what we are going to end up--well, if you really take the numbers apart, which the department is having a lot of trouble in looking at college costs because it is a big black box that has never been looked at before in very great detail, is that you probably have the undergraduates supporting this massive load of graduate students and researchers and other facilities at these big universities through their tuition, subsidizing them.

And in fact, maybe unfairly so, particularly for the neediest of the students, of the undergraduates. Therefore, you have this situation where if you ever manage to get through those first and second year science courses where there are 200 people and nobody cares about you and pop out the other end, you still don't get it because you are not getting the research either.

So nowhere along the--I mean it sort of takes your money coming in and you never get it coming out the other end. It seems to me there is an inequity there that is really fundamental to the whole structure of the university world today.

And maybe this task force can't do much about it, but think it is something we ought to at least keep in mind, because that is where all these committees begin to interrelate what the effects from one to the other.

MS. BISHOP: I think the one thing that task force can do is to present that argument in its report. If we see these types of scenarios and underlying factors and philosophical differences, I think we owe it to the reader of our document to bring it out in black and white, no holds barred, put it down, and say exactly what we feel.

MS. WINKLER: The problem is with costs, I can tell you because we have looked, you aren't going to find supporting data yet. I mean people are looking for it, but it is a feeling, you begin to have a sense that that's what's going on...

MR. OAXACA: I think you ought to bring it up in a black and brown way.

DR. REYNOLDS: Dr. Clive.

DR. CLIVE: I want to make sure I have got this straight. We are expressing dismay that the Department of Defense now pays only 10 percent of its budget to the universities.

Now I have been out of the academic world for quite a while. When I left the University of Michigan in the mid-1970s, there were large groups fighting tooth and nail to keep the Department of Defense out of the University of Michigan, and I am just wondering what has the--has the climate changed over the past decade?

DR. REYNOLDS: Markedly, markedly. Yeah, markedly. It is a slightly different number, it is not 10 percent. Would that 10 percent of the Department of Defense budget go to research in universities.

What--Dr. Clutter's number is that 10 percent of the research dollars coming into universities are derived from the Department of Defense. Those are two very different numbers.

MS. WINKLER: Almost all of that is at Johns Hopkins or something?

DR. REYNOLDS: Well, yeah, and the two big laboratories at the University of California and so forth. There really is a changed view on that.

But I do need to respond to Ms. Winkler on that issue. That is awfully complicated. Bennington, which does almost no research, has the highest tuition of any American university today, because they have a low endowment and they pay educational costs almost entirely out of tuition.

The system I represent, which is primarily a teaching university, derives virtually all of its money from state support, and we specialize in keeping very, very low state fees.

Then other universities fall between those two extremes, trying very hard to pull up resources from almost anywhere. In point of fact, and I hope we don't cloud this one up too much, I don't think a lot of literally student fee money goes to research.

The real issue is research is so darned expensive in this day and age anymore, and it is just so costly to do, and most of the--the big fight raging at NSF and NIH right now is the indirect cost issue, because so much of the agencies' dollars have to go to indirect things, which is a real cost to universities, and yet seem to pull away dollars from the individual research grants.

So it is terribly, terribly complicated.

OK, Dr. Clutter, any other comments on Dr. Clutter's? OK, let's move on, we need to keep moving, to higher education, Dr. Adams, Dr. Danek.

DR. DANEK: Much of the discussion that has been going on at this point relates directly to what we are doing, because there is such an overlap between higher education and research, and between the education and training element and research.

We have got basically two or three things that we would like to share with you and ask you look at. We have put two documents in front of you.

The first document is a survey, a proposed survey by Marsha Mattis, and that document is the one that says, "Programs to Increase the Participation of Female, Minority, and Physically Disabled Students in Science and Engineering."

This one is being done by AAAS, Shirley Malcolm's office, sponsored by NSF, to try to take a look at the activities that colleges and universities [INAUDIBLE] chancellors of the institutions to tell them what they are doing, to ask their participation and cooperation, and then to identify individuals, some of the kind of people that we have been hearing from, from the various colleges who are particularly responsible for programs for women, minorities, and the handicapped in science and engineering, so that they can key on the specific people who are running the programs, and then to conduct this survey.

What I would like you to do, if you have some time today, is to kind of run through this survey and see whether there is anything that hits you that you would like to see changed, modified, et cetera, and we will get your comments to Marsha at AAAS.

The target for the survey will be the--there is a broad range of institutions ranging from the top institutions to a selected group of minority institutions, to women's institutions, to state institutions in regions of the country that don't do so well in terms of competing for federal funds, to kind of take a look at some of the things that Herb was talking about.

Your comments on this would be very much appreciated. If you want more information on it, we would be glad to give it to you.

The second document that I would like to ask you to look at today is one in which you will be more actively involved.

MS. BISHOP: Excuse me, before you leave this...

DR. DANEK: Yeah, go ahead.

MS. BISHOP: I'm just curious. You mentioned that this would, your targeted audience would be high-level universities and colleges, and then you mentioned certain selected minority colleges.

Why is there a certain selection of minority colleges?

DR. DANEK: I could give you the list. There--we couldn't survey every institution in the country, we decided, OK? So we are doing a sampling.

And we are doing, basically what we wanted to look at initially was what were the top institutions doing, because of NSF's involvement heavily in research. That is what started this whole thing.

Then we said, let's expand it further. I have a list of institutions. I'm not sure I understand your question, but there is a list...

MS. BISHOP: Maybe the question ought to be, and maybe it is in here, or on that piece of paper, I was just curious as to the criteria used in selecting.

DR. DANEK: OK, one of the things that they were looking at was, which institutions, for example, are--produce a high number of students who get their baccalaureate degrees who then go on to get Ph.D.s, OK.

So they are basically the trainers of people who get Ph.D.s, what are they doing? Presumably, if they are doing something active in terms of taking minorities and women into science and engineering at the early age, then the pipeline problem may be modified at the outset, at the end.

The other was to look at 30 leading universities or schools where they have a high percentage of their women who get Ph.D.s, that sort of thing. The same sort of thing with those institutions that have a high percentage of minorities who go on to get Ph.D.s, the black Ph.D.s and the Hispanic Ph.D.s, et cetera, et cetera.

So those institutions that have had some record of doing something where we think that we might be able to find something interesting. OK?

MS. BISHOP: OK.

DR. DANEK: And then there were some, just a group of women's institutions and minorities' institutions. And then there was a question of why not look at some of the state institutions, probably every state we ought to look at the major universities within the state.

So, that is basically it. I would be glad to share this with you. If anybody else wants a copy of it, I would be glad to give it to you. OK, we will send you copies of it. And if you see a set of institutions or you want to add institutions, please jot them down and get it back to me, and I will get that information to Marsha's office.

Any other questions on that one? OK. The next document is a draft--and I repeat, a draft--but we would like your input. There are problems with it. I knew what the problems were before we even came here, and as I hear you talk, there are more problems, and they will probably grow as we go on throughout the day.

What we are basically trying to do here is to quantify some of the impressions that people have given, statements that have been made, about what is the federal government doing with regard to minorities, women, and the disabled in science and engineering.

This is a first cut in trying to identify these efforts. The format for the tables, for the data, providing, and those sorts of things is based on input from NSF. The Department of Energy has looked at our form and tried to fill it out.

The Department of Education, Nina Winkler has looked at it and filled it out. Agriculture has tried it, and NIH has looked at it.

So a number of the agencies have already began to look at it and know in fact that they can use the form, and we have modified it.

We have also had input from members of the higher education subcommittee, so I don't take full personal responsibility for this, so to speak.

What I would like you to do is just turn to about the third page, which is boxed in. Basically, we are asking you to look at this survey today, to make comments on it as to where you think we ought to change it, modify it, and why it won't work in your agency, or why it will work in your agency.

We would ask that you give us your full support on this, that you assume responsibility for seeing that the information is provided, that it gets appropriate approvals within your agency, and that it essentially gets to Sue Kemnitzer's office by January 30th.

Now let me back up from there. We are going to take this draft and your comments, we are going to modify it, and we will come back to you with a final draft, or a final survey, somewhere around December 15th. So we have a very short turnaround time, and then ask that you begin to fill it out, and then work with it from there.

What this survey essentially does is to ask you to, if you look at the box, third page, it essentially asks you to identify two different types of programs, actually three.

First is your targeted programs, which are designed specifically to enhance participation of minorities, women, and people with disabilities in science and engineering.

There are two kinds of categories in there. The first is category one, where the focus is on minority, women, and disabled, but where the competition is limited only to those groups. Examples of those are programs for support of minority institutions. Minority research initiation programs where only people that are eligible are members of the targeted group.

The second category, which targeted, may in fact be open to members not in the targeted group, namely institutions.

For example, Stanford, Cal Tech, MIT, University of California, to operate and run scholarship programs for moving more minorities and women into sciences.

So those are targeted programs. These should be easy to identify.

The next category is the hard one. That is identifying programs which are your normal programs, and we are asking you to take a look at those programs and identify to what degree or what percent of the funds go for minorities, women, and the disabled.

The third category is a catch-all. It is anything else that you do that you think is relevant, that may not be a funded program. For example, Mary mentioned this morning that the Department of Energy has an ombudsman program.

The NSF operates an outreach activity. And a lot of you do other kinds of creative things, which assist in this but may not be actually funded programs which go to recipients.

The other thing I would like to mention is that this does not, these programs do not limit themselves to universities and colleges.

So presumably all of the DOD programs would be included in here, not necessarily those that just went for universities and colleges.

What you are asked to do once you identify those then, if you will--there are instructions which I won't bother going through, but basically we have defined the categories, we have defined what we mean. We are asking you then to identify the programs by the primary purpose.

There are basically two different kinds of things that you have to do. The first is you have to identify, what is the primary purpose of this program? Is it education/training? Is it research? Or is it something else?

And that is a catch-all, and that may not prove to be helpful. But principally is it education or training, or is it research?

The second thing we are asked to do then is to identify--and I think it relates to one of the things that Herb was talking about--whether or not the focus of the program is on an individual faculty or student and/or an institution.

Now let me clarify that. Once you decide that this is a training program or an education program, then you have to say, who gets the award? If it is an institution, you then say, OK, what is the purpose of the grant?

Is it to enhance the institution's capacity to train? Or is it principally giving it to the institution to pass it to the students? In which case, if it is a pass-through to students, you ignore the institution, you ignore the institution and the objective is an individual support program.

Now that--most of your research grants are like that. The kind of thing we are looking for is the degree to which you operate programs to build the infrastructure of institutions versus simply to support individuals who happen to be in the particular groups that we are concerned about.

This may be a little hard for people as you go through it because it's not--they overlap so much. It isn't a clear sort of thing.

The second thing, the last thing we would like to know is we would like you to position these programs in the tables by whether or not they are aimed at benefitting individuals or institutions at the K through 6, pre-college, the middle school, high school, graduate, et cetera, along the pipeline.

So basically you are asked to identify your programs, categorize them, and stick them in a spot along the educational pipeline. And then to quantify it by putting the numbers in there for '87, '88 and '89.

And it may be that we will want to go back to '85, '86, and also, as I hear people talk, it may be that if you will also look at the last two pages, there is a series of additional questions on the last. What we are basically doing is saying, please, take a look, here is four sample questions that we might ask that we think might be relevant.

And add some questions that you think ought to be on the survey that you think the agencies ought to answer. I think there are a couple that were already discussed this morning, such as--that we might add here--and that is, for example, you mentioned, did you operate--this asked for programs that existed, you might ask, did you operate programs in the past, prior to this point, and why did you terminate the?

Do you have any special requirements in your review process for considering and raising proposals which are at or near the cutoff from the targeting groups, the minorities, women, and disabled.

So there is a whole series of questions that we could ask that we would like you to think about and list.

Once you identify the programs, fill out the table, we are also asking that for each program, and this is the second to the last sheet, that you fill out the one-page or two-page summary form, so that we can get a fix on what these programs are and where they are going and what they do.

DR. REYNOLDS: Thank you, Dr. Danek. Any questions?

MR. OAXACA: One of the things that continues to trouble me is perhaps our, at least my lack of understanding as to why the Asian American keeps making it through the pass despite the fact that it appears that that particular ethnic groups has equal to or worse dilemmas than other ethnic groups or other groups.

And it would seem to me that somewhere along the way we ought to see what they are doing and why they are getting there, and perhaps see if that is a model that we ought to use for what the task force has to do, which excludes pretty much the Asian Americans.

You know, Asian Americans look different, a lot of them speak differently. yet they make the cover of Time magazine in a very positive way. MIT stands for "made in Taiwan."

DR. REYNOLDS: Betty Vetter and I have been talking about this. Our experience, thus far, and there are not enough data to support it, and I would appreciate it if I were not quoted as saying this, but I think we are going to find out rather sadly that the Asian...

?: You want this off the record?

DR. REYNOLDS: This is off the record. That the nonnative-born Asians have just an astounding success rate when they are in the United States to begin with, the ones that were born in mainland China, born in Taiwan, Cambodia, Vietnam, and so forth.

After you immerse them in our moderately rotten culture, and they become second generation, in other words, the Japanese become Nisei. The Chinese become second and third generation Chinese, they behave just like American youngsters.

And I think, Betty, do you want to add that--this off the record conversation?

MS. VETTER: I think that there is a good deal of difference within the Asian populations, not only the difference that comes because they come from different cultures, all over the Eastern part of the world, but because they come at different times into our own culture.

And I think that the way to find it out, if we can get hold of some of the data we really need, particularly to California, which is another spot for Asians, and compare the Hispanic data, which I think is vital, they too have similar problems of different kinds of countries of origin, different kinds of problems within ethnic Hispanic groups, and different kinds of problems after they have been here a while and the assimilation hasn't helped them get up.

And I hope we have got some, that there is at least some of the data that we ought to have, might be available through the California system, so that we could look at students, preferably at the high school--Asian and Hispanic students, so we could have a handle on the two.

If we had the high school, the end of college, and perhaps at the Ph.D. level--that one will be the easy one--and see if [INAUDIBLE].

Asian students are no more all alike than Hispanic students are.

DR. REYNOLDS: I think you make an excellent point. I think we need to probe it and look at the data on it, and kind of try to learn from them and get our bearings on it. I agree with you. I think we need to look at it.

MS. MEJIA-WALGREEN: I just wanted to tell Mr. Oaxaca that one of the witnesses that we have testifying today, Dr. Stevenson from Michigan has done a comparative study over many years of students in the United States, Japan, Taiwan, mainland China.

And having read some of his work, I thought it might be useful to have him come and tell us what are the differences in the...

DR. REYNOLDS: So he is going to address this?

MS. MEJIA-WALGREEN: So he will be addressing part of this problem which you have raised.

DR. REYNOLDS: Excellent.

MS. KEMNITZER: Please ask him questions.

DR. REYNOLDS: Yeah, let's do, let's really...

MS. MEJIA-WALGREEN: I bring this out because I have read,you know, a lot of his works, and that's why I wanted to hear it--what can you tell us that we could do differently? Were we doing it? Or we ought to do what they are doing, or what are we doing that they are not doing? Is it changing?

DR. REYNOLDS: And Dr. Vetter and I had had a brief conversation about that in Chicago, and I had said I would be glad to try to go for some of the data, and she just coming forth following your question is a proposal for the kinds of data that are needed. So we will--we may need to work on it further depending on what Dr. Stevenson says.

Dr. Adams or Dr. Danek.

DR. ADAMS: I was going to ask one other question that has, a concern at least, I don't know how we can get it [INAUDIBLE], but we might ask it in a different kind of way. I am again concerned about at the graduate level, so we have been trying to figure out, simply because the number is even worse at the graduate level in science and engineering than they are at the undergraduate level.

What are some of the factors in there? A couple of things that seem to pop out. One, a friend of mine who works at Carnegie-Mellon just did a little [INAUDIBLE] survey to see whether or not there was in fact this cluster that we talk about--the significant numbers where you have got people to talk to.

And in fact we took 20 of the leading institutions in the country to find out in fact are there as many as 10 Japanese who are getting Ph.D.s. So 10 at all of the schools, there were 10 Chinese.

So that, one, the critical mass was there. And at the same schools, there was one black trying to get through, one Mexican-American trying to get through. So there was nobody to talk to.

I know at my own institution at Notre Dame, you can find the Asian table in the faculty lounge, and I as a black, there is nobody else in there but me. So that's one thing I think you ought to bring on the table.

And I am not trying to make up an excuse here, but I am trying to at least answer some other kind of things.

I think another factor that we want to try to find out is, is how is it that they compete for these fellowships that we are talking about and we don't seem to get them.

Within the embassies, they have somebody who that is their [INAUDIBLE]. I mean they put a lot of emphasis on flushing out, where can you send these 10 Japanese to find this money?

And one of the arguments I have been having is in the United States we have nobody to tell students how to find money to go to graduate school. So one of the other kinds of pieces that as you talk about the kinds of things that we are dealing with here, it isn't by chance that these people--you know, I am trying to figure out how does everybody figure out that the best technical school in the country, one of them is Shawan [PHONETIC] College in North Carolina.

I mean how can you find that in China. Well, the embassy knows that that school is down there and they funnel 30 people per year to Shawan College, to go down there to get this technical frame that you need to take back to the country [INAUDIBLE].

So I think if we look at that kind of--one of the things that apparently popped out, and we were very surprised at that, that there was a critical mass of people there coming through the pipeline, and I have been much more conscious of that this fall as I have been giving [INAUDIBLE], because I have asked that even by department, how many people do you have from the various locations.

And it is coming out that there is this critical mass of people that, on the same wave length, they do get together, they live in the same apartments. They come to school, they have dinners together on Sunday nights and that kind of stuff, where we don't have that.

At Notre Dame, in engineering this fall, we have got two black folk in graduate school, two. One is doing his dissertation, he is completing, and the other one is just getting started, and they are not in the same department even, so there is no help...

DR. REYNOLDS: But we are going to have to be careful on that. I'm just very quickly as you were talking reading Dr. Vetter's paper here. We need to remember, for example, that the greatest number of foreign graduate students we have in the United States come from Taiwan.

And the top three categories are all Asiatic. So with a very high selection process in those countries, those countries send graduate students, paying full fare for them to our institutions.

So I mean that is a little bit of a different situation, and then the number you have here, Dr. Vetter, "Among all Asian doctoral scientists and engineers working in the U.S. in 1985, 93 percent were foreign born."

Conversely, although persons of Asian ancestry make up two percent of the U.S. population, this group makes up less than one percent of U.S. born Ph.D.s in science and engineering.

So I just stress that we have to go slow and be careful before the data are in on this particular issue. There is a growing concern in California right now about Asian gangs. Many of the similar problems because of low socioeconomic status, youngsters are banding together and developing very strong criminal tendencies and not going through school.

So I would just urge us not to rush to judgment on this issue until we have more data. I think there is a myth there that the data very well may dispell.

DR. DANEK: Let me just--could I make one comment? This was intended only for underrepresented groups in science and engineering. Is it your suggestion that we ask the agencies to break out in their regular programs how much money goes to Asians?

DR. REYNOLDS: I think it might be useful for the contrast, and as long as you are doing that much, I think it would be useful. Can they give you numbers of--would they have whether they were foreign born or native born?

DR. DANEK: This is going to be a real problem. The largest source of funding. I mean the largest--our feeling is that targeted programs are easy to identify. There is a million here, a half a million here, two dollars here, six dollars there--the large bulk of money available for the activities if you are going to make changes comes in the form of trying to change the sensitivity of the peer review community, change the sensitivity and understanding of those people who control the major amounts of funds, not the targeted funds, but the regular funds, if you are going to integrate into the mainstream program.

So it is critical that we identify these areas in these regular program areas.

DR. REYNOLDS: Let's talk about that a little bit later. We maybe should go for it, because my impression is that actual research dollars going to Asian scientists are quite small, if you especially took NIH, it would be a very small proportion.

There are relatively few out there.

DR. DANEK: That's right.

DR. REYNOLDS: I mean this might help illuminate what I am calling a little bit of a myth here, so...

DR. CLUTTER: We won't be able to get that information, because we would--they're not quoted.

DR. DANEK: We do at NSF. Can I make one other comment?

DR. REYNOLDS: Yeah, and then we need to move on.

DR. DANEK: There are--don't make this out to be harder than it is. There are really only three tables--Table 1, Table 2, Table 3, all right--one for minorities, one for women, and one for disabled.

And it may be that you will have it all on one. It may be that you will have a big zero on it, and that is important, too.

MS. KEMNITZER: We want to know that.

MS. BISHOP: To whom are you going to send--are you sending it to the agencies.

DR. DANEK: I will send it to you. You will be responsible for getting it in your agency and getting approvals.

MR. FERNANDEZ: I've got a quick question. Are you--you said you were [INAUDIBLE]. Are you sending out surveys to the universities, too, in addition to this? Or is this it?

DR. DANEK: The survey is the one you saw. If you want something else or modify it, there are two of them.

DR. REYNOLDS: There are two surveys, one to...

MR. HERNANDEZ: All I am asking is if their committee, the research committee, is going to put out something else, other than the higher education committee?

DR. CLUTTER: Yes, we already have a letter that we sent to universities.

MR. HERNANDEZ: OK, so you will have two sets of data then.

SEVERAL VOICES: Yes, great, that's true, right.

DR. REYNOLDS: OK, let's keep moving. Pre-college education, Ms. Kemnitzer.

MS. KEMNITZER: Well, if I might presume to speak for the subcommittee, because I was the--I guess I am the only person here who was at their last meeting.

And the main thing to report is that the group is considering, as part of their reporting effort, doing a video or film which would be addressed to teachers, counselors, parents on the importance of encouraging their children to take math and science in school, the idea being that the needs of the middle school are key, and in turn that parents especially need to be reached, and the idea of a film or video geared to them and to the students seems like an important area to address.

Nothing has been launched. I don't mean to say this is anything that is cast in concrete, but that is the major idea that was discussed at the last session.

MS. WINKLER: May I say that there is not even unity on that subcommittee, particularly on the propriety of using funds that have been given for purposes of travel and expenses of this committee.

MS. KEMNITZER: This would not be funded through the contributions to the task force. Other funds would be sought from some other place.

MS. BISHOP: Let me understand that. Are they--they are recommending that the task force prepare this video or that a video be done by whom?

DR. REYNOLDS: Instead of a report...

MS. BISHOP: Oh, instead of a report, playing videos...

MS. KEMNITZER: This is all quite preliminary.

MS. BISHOP: Well, what is our product from this task force?

MS. KEMNITZER: The task force generally?

MS. BISHOP: Our product for the task force in general is a report.

MS. KEMNITZER: We are supposed to issue a report to the Congress, to the President, and the heads of each agency.

MS. BISHOP: Ok, we are talking about written words.

MS. KEMNITZER: That is correct.

MS. BISHOP: Yeah, Ok, I am just trying to understand...

MS. WINKLER: As I said, there is not unanimity on that subcommittee on [INAUDIBLE].

MS. KEMNITZER: So this is just an idea that is being discussed. I don't want to make it sound like it is more concrete than that.

DR. REYNOLDS: Other questions or comments? OK, thank you very much. That brief report puts us back on time. We thank you for that, Ms. Kemnitzer.

To sum up now, we are going to ask each task force then to come up with straw men recommendations, some tentative ones for this group to consider in California, and we will make sure that we have enough time sitting as a whole group to review each of those one- or two- or three-page papers.

I would hope they would be brief, so that we could just look at overall conceptual notions of where the task forces are going, and where at this stage, if they were to come in with the recommendations, where they would be.

Now, I would like to summarize hearing ground rules.

Most of you have been with us on this traveling road show until now, but one or two of you have not.

I am sure that parts of the hearings are starting to seem a bit repetitious, but that certainly is not the fault of the people who are testifying. It really comes as a result of earnest determination on the part of a lot of people who really care about the issue we are all addressing.

So there is just bound to be some repetition. I have been--and I was kind of a doubting Thomas--I have been made a true believer by these hearings.

I have been touched, moved, and have found them terribly, terribly useful in molding my thinking, and I have heard that from the rest of you as well. A lot of important information, a lot of feelings have emerged from them.

Now I also think that the second major role of them is giving our work credibility, the impact, if you will, on the people who are testifying, that all of us are out here trying very, very hard to elicit the level of concern, to elicit what is going on in this nation with respect to women, minorities, and handicapped in the sciences.

There is certainly no doubt in my mind that there is an urgent need for this group and our work at this time, and that has emerged also from hearing these various testimonies.

We are going to have time today between three and five for a group discussion. I think that may help us a bit to facilitate the testimony, and I would urge us that the group not try to discuss among itself after testimony, that if there are questions from an individual testifying, to clarify testimony, something that one didn't understand, ask those questions.

But in general, reflection, your own reaction to testimony, and so forth should be saved until our discussion session at three o'clock.

That ought to expedite our being able to get through the testimony fairly quickly. I stress again, we should not argue or contest testimony that comes in, even if you have severe questions about its credibility, because these people are here volitionally trying to be helpful, and perhaps it is just best if there is something you have a serious question about, to make a note of it and to make sure that we are all aware of it during our subsequent discussion.

There will be a 10-minute summary allowed from each testifier. The bell is going to ring at nine minutes--did we forget our bell, Deborah?

?: No, we have it. It was in my bag. I'll get it, right out there.

DR. REYNOLDS: You looked unnerved.

?: No, I didn't realize I had my bag with me.

DR. REYNOLDS: All right, fine, we have got the bell that will ring at nine minutes. The testimony will be followed by question and answer sessions, and that is the way we will proceed. Any questions?

DR. ADAMS: I have a sense that we are being rushed a little bit in this morning's session. I don't know how we can resolve that. It doesn't bother me because I am a morning person, so I would have no problem even adding a few more minutes to this, but I would hate for us to have some questions that we need to get resolved here, or some comments that need to be made and they didn't get made simply because all of us are conscious that we need to finish by 5:15, let's say.

DR. REYNOLDS: Well, my concern is we have got people coming to testify at 9:30...

DR. ADAMS: OK, I don't have problems this morning.

DR. REYNOLDS: The bear is on our back. This afternoon at three o'clock we will have time for more...

DR. ADAMS: I guess the point I was trying to make, somewhere in this whole scenario we are going to have to add some time.

[END OF CLOSED SESSION]

PUBLIC HEARING

DR. REYNOLDS: I would like to welcome you to the public hearing of the Task Force on Women, Minorities, and the Handicapped in Science and Technology.

We thank you who have come to testify and I thank the members of the Task Force, who are identified with name plates in front of them this morning.

Our first witness this morning is Ms. JoAnn ~~Joann~~ Platt from the Office of the Governor, representing Governor Ashcroft. Ms. Platt, we will put you right here at this table.

MS. PLATT: Good morning, everybody. I found out who drank their coffee before I got up here. I found them in the kitchen anyway.

It is a real pleasure to see so many of you here. This is an area in which we all share [INAUDIBLE]. As Administrative Assistant to Governor John Ashcroft--can you hear me?

DR. REYNOLDS: Ms. Platt, you might be more comfortable if you would just sit there. Would that be all right?

MS. PLATT: I have never talked to an audience with my back before.

DR. REYNOLDS: Well, we are your audience this time, I'm sorry to say. We are.

MS. PLATT: As Administrative Assistant to Governor John Ashcroft and Director of his [INAUDIBLE] office, as well as his chauffer and his gofer and many other things when I hear of them, if I am located in the Kansas City office.

I bring you his greetings and again his best wishes for a successful conference here in our community, and the gratitude for the fine work that all of you are doing.

In this instance, I think Governor Hayden does not have someone present here today, because in both Kansas and Missouri we often have two governors for the price of one.

I also would like to extend the greetings of Governor Hayden of Kansas. We have a very, very close relationship in this community of states and our [INAUDIBLE], and in particular, with our new Summer-Tech Project that we are hoping to get here in Missouri, for which we have the total support of our sister state, Kansas, and Iowa, Nebraska, and many others.

This is a vital interest to us in the field of science and technology, because this is one of the things that [INAUDIBLE] very difficult for us to draw the quality of people that we want.

So I do also extend the Governor's--Kansas's greetings to you all and appreciation for your joining the Greater Kansas City area.

I am frequently called upon to be Governor's Ashcroft's spokesperson, when as often as he would like to be here, he was unable to be here in person. And [INAUDIBLE] on behalf of the state of Missouri, we welcome you as representatives of your many fine and concerned organizations and institutions as visitors to our state and city.

But perhaps most of all, we welcome you for the goals and the purposes of your Task Force and are pleased to have you examined and promoted here in Missouri. There can be no question that there is underrepresentation of women, minorities, and the handicapped in the areas of engineering and technology and science.

And with that, you have the twin challenge that all the experts are telling us that we are having a national shortage of people to do this kind of work.

When we are to reflect our national tradition of drawing upon previously untapped human resources to achieve the expansion, development, and progress that otherwise would be beyond our reach, we will have to find [INAUDIBLE] and find new resources in our women, minorities, and our handicapped people.

Those of you who from Missouri know that Governor John Ashcroft has a very real, special, and dedicated interest in education. We are concerned about potential shortage of qualified teachers in all fields of endeavor.

And this issue extends beyond the issue of minorities and women and handicapped people, but includes all of these, because it affects all of us.

We are addressing the problem in Missouri in a number of different ways. Beginning in 1986, we began offering 210 scholarships for high school graduates that graduate in the top 15 percent of their class if they are willing to go into teaching as their chosen field.

We put a special emphasis on attracting minority students to this area.

Very substantial financial rewards are offered to our teachers, through what we call the "career ladder system," for improving their education and their teaching skills.

Excellence in teaching awards are made statewide, and I meant to check with [INAUDIBLE] as I linger over 5,000 excellence in teaching awards made throughout the state of Missouri last spring.

Members have recently announced a program which we call "school report cards." It stirs up lots of interest in the newspaper, but primarily it is a program by which parents and citizens may judge their school as compared to others in their own neighborhood and throughout the state.

This year, $2 million has been appropriated by the General Assembly and signed by Governor Ashcroft to upgrade the equipment in the University of Missouri School of Engineering.

Last year, we began offering $2,000 scholarships to Missouri students who ranked in the third, three percent of their SATs and ACT tests and get that if they will stay in the state of Missouri.

I think there is something like 2,000 students who qualified in that and over 900 of them chose to stay in our school of [INAUDIBLE] into technology, engineering, and science.

And in the Excellence in Education Act of 1985, we mandated testing for key skills of math, science, and comprehension at grades 2, 3 and 4. So if we are having a problem, we will know it early enough to begin to remedy that problem.

Well, those are some of the things that we are doing in the schools or teaching that we feel will benefit the women and minorities and the handicapped. We also have established a new academic award for high school seniors graduating in 10 percent of the the class, which we call the George Washington Carver Awards. You will recall that he was our--Missouri's most famous scientist, and [INAUDIBLE].

On the employment of the handicapped, I hope [INAUDIBLE] here who is from the Wares [PHONETIC] program on employment of the handicaped. Here in Kansas City, we have a project called HOP--Handicapped Opportunities Project.

The program started with something like seven to 10 people. It is now over 70. And in our St. Louis area, we have something called the Placement of Assistance to the Handicapped, and in this program we utilize our employment security computers--and we happen to have some of the very best in the country on this--where we can put together those people with job opportunities for the handicapped and those who are qualified for those jobs, and do it through that program, and it is accessible only to the handicapped.

We also have a new program on personal care assistance [INAUDIBLE].

In the women's area, Missouri has many departments. We are working in the area of working women and professional women, and in 1985, we recommended and the General Assembly approved what we call--you always take a breath before you say this, because I served on this--the Missouri Council on Women's Economic Development--all in one breath.

I have a special interest in that myself because I am a product of the private sector. I found the that the company [INAUDIBLE] joined the world of bureaucrats less than a year ago.

So it is interesting for me to see the women geting into more and more fields. Mine was not science and technology, but it was definitely a man's field and [INAUDIBLE].

In addressing the National Council on Action for Minorities in Engineering earlier this year, Governor Ashcroft says, "As American citizens of a nation needing the talents of all its people [INAUDIBLE] their opportunities, our aspirations [INAUDIBLE]. We must provide the education and opportunities to permit every person, man, woman, handicapped or not, to engineer his own fortune. We must and do reserve for the institutions in the role model that advance the values of this effort [BELL] and progress."

You have come far in the long cause. We are proud to be part of you here. We are proud to have you in Missouri, and

I do thank you for this opportunity to join you this morning.

Thank you.

DR. REYNOLDS: Thank you. Thank you very much, Ms. Platt. Any questions? Good. Thank you very much.

Our next witness this morning is Dr. Diana Helsel, Associate Dean, College of Agriculture, University of Missouri in Columbia. Dr. Helsel.

DR. HELSEL: I have got some materials if you would like to follow along.

DR. REYNOLDS: Fine, that would be good. Perhaps we could help in passing them out. [PAUSE] Please go ahead.

DR. HELSEL: Women, minorities, and the handicapped are underrepresented in the sciences that I represent, the food and agricultural sciences. This represents a substantial omission since about 22 percent of the U.S. work force is employed in one form or another in food and agriculture.

The percentages of females in these disciplines range from approximately 65 percent of the bachelor science, food scientists, to three percent for Ph.D.-level agricultural engineers [INAUDIBLE] minorities.

You have an appendix in your material that will help you define the disciplines that I represent, and also provided are some estimates of the percentages of women and minorities in these areas.

We are short of trained personnel, from the bachelor of science level all the way through for Ph.D.s. Food and agricultural sciences mirror the same trends, as you are well aware of--I know there is decline as you move to [INAUDIBLE] degree levels.

There are few women ag faculty and virtually no women agricultural administrators. Many of our minorities are concentrated in 1890 schools, and I think it is very easy to understand this pattern, once you know what to look for.

So I would like to give you, first of all, a common example to illustrate some of the problems. Once we have identified some problems, I think it is easier to design solutions.

Sally, what do you want to do when you grow up? I want to be a biochemist. That's nice, honey, but that's too hard for girls. Now what do you really want to be? Don't you think you should pick some nice occupation like nursing or teaching that you can always fall back on if you need to?

There are lots of implications in that kind of a typical interchange. First of all, lack of intelligence is implied. Lack of suitability of biochemistry for girls implied.

The implication that Sally is not being serious about biochemistry, the implication that careers and family responsibilities are going to conflict, and also the presumption that Sally will have a family, and that the burden of that family is going to fall on her.

These types of interchanges, I think, go on very recurring themes for women and minorities throughout their lives. One of your attachments provides samples of the kinds of comments that we typically hear that undercut the desire and ability of women and minorities to enter and persist in the sciences.

To deal effectively with recruitment and retention of women and minorities, I think it is important to focus on some specific developmental stages that are chosen today, are early childhood stage, career decision stage, and a professional development phase.

OK, each one of these developmental stages--I think there are some recurring concerns including role models, self confidence, public role definitions, differential classroom expectations or treatment, peer pressure and social acceptance, parental or familial expectations, and the availability of accurate career information.

Keeping these problem areas and ages in mind, I would like to describe to you some strategies that work, some that are needed if we are to recruit and retain women and minorities in the sciences.

First of all, the early childhood stage, the development phase of our children in elementary and junior high school is when they begin to [INAUDIBLE] their future options.

In my position as a college administrator, I spend time addressing children's perceptions. Example, we demonstrate our disciplines to students, as well as teachers and their parents. We have a children's [INAUDIBLE] which we saw 900 students in one day this year.

Now that is a very traditional, stereotypic event for us, but it targets an age group that we can't ignore. If we actively involve the students at a young age, they will retain their interest in science.

Another example: last year, our Mortarboard chapter visited sixth grade classes throughout our school system to tell them what it is like to be a college student. The students were very eager to learn what college was like and how to prepare for it.

By helping students to set their expectations very early, we felt that more were going to acquire the skills, motivation, and strive for scholarships that will allow them to attend college and complete their education.

This is particularly important for first generation college students.

At the present time, we are organizing hands-on science events for other age groups in the school system as a pilot to see if we can enrich their definitions of sciences and continue to keep them interested in these disciplines as future careers.

We have not addressed how to help teachers be sensitive to the differential attention and treatment that female and minority students receive in the classroom, and I must also note that providing role models for women and minorities in the sciences is very important, even at this early age.

Most of our attention has been focused on the career decision phase, which I will target as being during high school and the early college years.

Here, role models are critically important. We are striving to bring both academic and industry personnel in touch with current and potential students. There are a lot of us who would have dropped out of the sciences had we not been able to look back on a role model and say, if she could do it, I can do it.

Summer science programs, such as our Missouri Scholars Academy, allow students who are interested in the sciences to congregate together and expand their horizons.

Aside from the academic standpoints, there are some critical components to these programs, such as bringing students with similar interests together so they can form a support group and not feel like oddballs.

Allowing students to develop self-confidence in their abilities, helping students to see that their interest areas are very worthwhile, and instilling a sense of pride and accomplishment in the students and their parents for program completion.

Internships programs allow students to gain hands-on experience that greatly build self-confidence. Female and minority students are not less competent technically than their white male counterparts, but they typically feel less competent.

Internships are absolutely irreplaceable in terms of building confidence that allows women and minorities to persist and succeed.

Making career information available in high schools, colleges, and in publications helps students see options. There are a number of opportunities and examples that I could provide for you. I have to emphasize also that accurate career information that is keyed to a student's abilities and goals in life is a central element in student retention.

Teacher and counselor education relative to who is in the sciences and what their opportunities are form another important facet of the recruitment of women and minority students in the sciences.

Scholarships provide important incentives for students to pursue the sciences. One of my best recruitment tools happens to be a very substantial scholarship program. There is a brochure in your material that describes a new model undergraduate scholarship program that has generated a staggering amount of interest.

I would say that we need more of these types of programs. Sensitive advice for students is very important.

Counselors and college advisors need to recognize that women and minorities are going to have many more doubts about their abilities, their acceptance, and their career paths than other students.

Intervention to head off early frustrations is also critical for many of our students. Again, sensitive and committed teachers and faculty can help provide the moral and technical support that is needed.

Ensuring that female and minority students are not relegated to the place of notetakers in laboratories also deals with this type of sensitivity.

Programs that engender support from home are going to be strong assets in keeping women and minorities in the sciences. I can tell you all kinds of stories of talented female students or minorities who never came college or left prematurely because someone thought that their place was back home.

Another program that is a striking success, at the graduate level this time, is the National Needs Fellowship Program, approximately 35 percent of the fellows are women.

The professional development phase or those early career years are years when great educational investments may begin a payoff or may be lost. To encourage the retention of women and minorities as professionals in the sciences, the following areas [INAUDIBLE] of importance.

Women and minorities must have peers to associate with. Mentors are very useful in helping new professionals gain confidence. Providing visible and consistent affirmative action policies is also important.

I have to emphasize this one point particularly. Providing support for personal roles, such as day care. One of the reasons a lot of women don't even enter professional positions or career areas [INAUDIBLE] that they see no means of reconciling their personal and professional roles.

Too few institutions realize what a substantial problem this is when women select careers and as they continue on their career paths.

I think it is necessary for us to recruit and retain women and minorities in the sciences if we are to maintain U.S. competitiveness. [BELL]

About several problem areas, progress has been made.

Thank you for the opportunity to share my thoughts with you.

DR. REYNOLDS: Thank you, Dr. Helsel. Questions from the group? Yes, Dr. Clutter.

DR. CLUTTER: Yes, Dr. Helsel, you mentioned that fact that sensitive advice from counselors was absolutely essential. What do you do in the College of Agriculture to train such counselors?

DR. HELSEL: We have in-service training programs, in essence, for people who try and work one-on-one, distribute some papers to faculty to let them know what is going on. A lot of it happens to just be groups of interested faculty, get together to provide support for them, send them away to conferences.

There is no major national [INAUDIBLE] program of any sort that I know of. We do it mostly based on sensitivity to an individual's needs and [INAUDIBLE] the rest of the program.

DR. REYNOLDS: Dr. Clive.

DR. CLIVE: This might be difficult to make a quick response to, but one of the charges we have is to examine the underlying broad social factors that may affect the progress of our target groups in science and technology.

The lack of day care is a symbol of one of those broad factors. Could you think of any others that play a role and what solutions, what long-term solutions might be offered?

DR. HELSEL: The day care might be sort of symptomatic of a lot of different problems. I think that you could add in there keeping up the house, having a realistic--for women--having unrealistic expectations about what they are going to do.

You can talk about the superwoman syndrome. And I can relate very well from experience a lot of women have had, to have these very unrealistic expectations on many, many different fronts.

And I think that one of the underlying solutions to it is for women to be able to adjust how they--or what they expect of themselves. I think we expect too much. Part of that is conditioning, part of it is societal, but it is a problem that I think only gets resolved within ourselves as individuals.

And that is what the underlying problem is--I think we expect ourselves to be the perfect homemaker, the great wife, as well as the super professional.

DR. REYNOLDS: Oh, excuse me, Dr. Adams and then Dr. Bishop.

DR. ADAMS: One question. You talk about the Missouri Science Academy?

DR. HELSEL: Yes, Missouri Scholars Academy.

DR. ADAMS: Scholars Academy. Give us some notion of who funds it and the criteria for participation.

DR. HELSEL: It happens to be a program that, to summarize, would be for gifted students. They arising juniors, they have finished their sophomore year. The funding comes from the state of Missouri, the General Assembly, as well as some corporate support.

Approximately 300 students participate each year, and they are--each school is eligible to nominate at least one student. They tend to be in the top three percent of their high school class--same type of thing if you looked at SAT scores.

So they are gifted students. They spend five weeks on campus, seven days a week, start out at six o'clock in the morning, and finish up at about 10:30 at night, very full activities, but absolutely amazing what it does for those youngsters.

DR. REYNOLDS: Thank you. Last question from Ms.

Bishop.

MS. BISHOP: I have two. Number one, could you explain the 1890 schools.

DR. HELSEL: Schools such as Tuskegee Institute. A lot of our black administrators and black faculty are concentrated in those types of institutions.

MS. BISHOP: What also is the track record of your students going out into the work force in the field of agriculture? Have they been successful in that?

DR. HELSEL: In placing them once they have graduated?

MS. BISHOP: Yes.

DR. HELSEL: By and large, yes. It doesn't appear that we have substantially different attrition rates for women. Now we have not had that many minorities graduate, so I couldn't give you bonafide statistics on that.

But women's attrition rate doesn't seem to be all that different from male students.

MS. BISHOP: But they are able to find jobs?

DR. HELSEL: Yes, they are able to find entry-level jobs. Now what happens five years from now after they have been in the work force for about 10 years is open to speculation.

It looks like we are going to have a high attrition rate for some of the women, just like we have seen in business or many other careers because of these frustrations.

MS. BISHOP: Are they more into private or public or government?

DR. HELSEL: They are pretty well split.

DR. REYNOLDS: One last quick question from Dr. Danek.

DR. DANEK: Yes, within the university, is there an overall coordinating activity in which your program fits, or are you basically out on your own?

Second, is there kind of any collaboration between the various deans of the colleges concerning efforts?

DR. HELSEL: My program is within the Office of Resident Instruction, which handles graduation requirements, academic programs. So this is a subset of the responsibilities that the people in my office have.

There is pretty good cooperation among the different deans for the divisions on campus. Everybody--we have a very decentralized system at the University of Missouri, so you won't see parallel programs necessarily. But a lot of people are following similar tracks.

DR. REYNOLDS: Doctor, I have one quick question of you. Do you sense that minority--you address most of your comments to women--but agriculture enrollments by minorities, are those numbers not leveling off? Do you know those data, by any chance?

DR. HELSEL: They are real difficult to get good data on both women and minorities. We have tried recently from the professional societies, and women, for example, would use their initials instead of their first names, so you can't categorize them.

It is a particular problem for us to recruit and retain minorities in agriculture.

DR. REYNOLDS: Do you have any--how long have you been in your present position?

DR. HELSEL: This position for a year. I was the Assistant Dean for about two years before that.

DR. REYNOLDS: Two years. So it is a little recent for you to give us an anecdotal impression as to whether those numbers are tailing off a bit?

DR. HELSEL: I can look back over the last several years. We have done some studies going back to the sixties. Percentagewise, we are about the same. We are losing in terms of total enrollment at this point at the university, not substantially, but the high school pool in Missouri is decreasing.

We are not making any progress in terms of the percentage of minorities. As a matter of fact, the last two years we have declined somewhat. But those numbers are fairly small.

DR. HELSEL: Thank you for your comments, we appreciate it.

Let us go on then, please, to Ms. Karen Hummel, Director, and Mr. Tom Cummings, Associate Director, Mid-America

Consortium for Engineering and Science.

MR. CUMMINGS: Dr. Reynolds, Mr. Oaxaca, Task Force members. Students' perceptions of their future potentials are limited by a lack of awareness of the wide variety of opportunities available to them.

This lack of awareness leads to a lack of motivation. To prepare themselves to take advantage of these opportunities by preparing themselves in high school to excel in college.

There is a nationwide effort now to increase the number of minority, women, and handicapped students pursuing careers in science and technology. This effort consists of a number of programs that share key effective elements.

Effective implementation of such programs positively impacts the numbers of minority, women, and handicapped students aware of potential careers in science and technology who are effectively preparing themselves in high school to pursue these careers as undergraduates.

Students participating in such programs as MACESA can provide you with their perceptions of how they view their futures and how such a program has influenced them.

I should like at this time to introduce two of our MACESA students, Dawn Cunningham and Douglas Juarez from Wesport High School here in Kansas City, Missouri.

MR. JUAREZ: Good morning, my name is Douglas Juarez, and I am a member of MACESA at Westport High, and I am here to represent and to express the feelings of the students and the way I feel about MACESA.

I feel that MACESA is an important program because they provide us with the opportunity and the knowledge that we need to--we, as minorities, need to go to college and prepare ourselves so that we can succeed in this society.

Also, they are able to prepare us by--they give us study sessions, tutoring like every week, so we can stay after school and improve our grades so we have a better chance of going to college.

Also, enrichment programs which I had a chance to participate in this summer helped us a lot to experience college life and see the importance of college and different fields in which we can go into it, and to experience what each field provides--what each field can do for us in engineering.

The trips are also important. I participated in many trips for MACESA to different colleges, like Ralla [PHONETIC] and KU to give us a feeling of what really college is, and to feel like--before I used to think of college like a place like there is no way of getting in.

Now that I have participated in trips and enrichment programs, I can see that I have of going there, and that is through participating in MACESA programs and places like other clubs in which I can improve my grades, so I can go to college.

I am proud to be a member of MACESA because it helped me academically and socially, and has helped me choose the career in my future. I am planning to become a computer engineer, and most of the credit I give to MACESA because it has helped me a lot to communicate and to express my feelings.

I won a first place in a [INAUDIBLE] idea contest, and most of the credit I give to MACESA because through MACESA I was to express my ideas and the way I feel about things. It helps you reason things out.

I believe that without a program like this I wouldn't, the knowledge, the opportunity would not be available to high school students. Thank you.

MS. CUNNINGHAM: Good morning, my name is Dawn Cunningham. I am also a [INAUDIBLE] and I am from Westport High School in this district, right up here on [INAUDIBLE] Street.

MACESA has influenced everything around us. It influences our school, our students, even our parents, our staff, because before we had MACESA, we didn't really know what we wanted to do with our life. We needed help with our careers coming before we got out of high school, because we didn't have any road to travel.

And when MACESA came, [INAUDIBLE] in our sophomore year, it helps us plan [INAUDIBLE] most of the MACESA students are interested in science or math, and with a possible 3.0 grade point average to enter MACESA, and to keep that MACESA grade point average, we pass study sessions to help us, and when we have done this work, able to participate in the summer KU program for two weeks.

They gave us a feeling of college study. We had classes [INAUDIBLE] to help us see what college life is about. [INAUDIBLE] to at least five colleges visiting, and to see if we want to go there. We have been prepared for the SAT and the ACT, and they give us an early chance to take the test so that we can be prepared when the time comes enough.

It influences our parents because they watch [INAUDIBLE] come home, you know, where are we going this week? Or do you have something planned for MACESA, have a test to take this week? She's happy I am taking tests. She is glad I am trying to [INAUDIBLE] to see which one I want to go to.

I want to be [INAUDIBLE] management. Now I know the classes that I have to take before I can enter college, and MACESA has helped me to perform [INAUDIBLE]. MACESA tells the students and the staff that MACESA students need things.

We have our advanced classes right now in our schools. I am now in advanced chemistry, advanced computer programming, and I need to continue my engineering career. We need more contests. We are more enthused and contests help us, they help us [INAUDIBLE] as recently won a first place in a contest that [INAUDIBLE] created an engineering project.

And we need more trips, we need more programs and contests to participate in to enrich our knowledge of our careers that we plan. Thank you.

MS. HUMMEL: Before I speak, I would like to introduce a few members of the audience who are here and are also a part of this support group for minorities in engineering, pre-engineering programs.

MACESA is a consortium of universities. You will see in the brochure the universities, and also involves a number of high schools and industries. It is a network, and some members of the audience are Florence Goldrich, who is [INAUDIBLE] director, a minority engineering program director, at the University of Kansas, and [INAUDIBLE] Ed Young, science director in Kansas City, Missouri, schools, and is a big supporter of MACESA. [INAUDIBLE]

Charles Rankin, who is Assistant to the Provost at K State and a longtime advocate of minority education and [INAUDIBLE].

Using Westport High School as an example, since the initiation of this infant program--at the beginning of the program, Westport offered chemistry and physics in alternate years. Now they have two sections of chemistry, one section of advanced chemistry, [INAUDIBLE] physics.

They have got pre-calculus and an advanced computer course. These are indications that more students are enrolling in these classes, becoming [INAUDIBLE] back again to college.

The program, now in the case that it is just developing, but it is modeled after a lot of good programs in the nation. Good programs start early and they don't let go. They provide the kind of support base for minority pre-engineering students and pre-college students that are, have been traditionally supplied by family and society to white males.

It is just, they thrive on [BELL]. Good programs do that--and my time is up that quickly [AUDIBLE].

Again, I find the characteristics of effective programs, they are tangible and intangible. They are quantifiable and those things that you have to sense that are still essential for good programs.

You can utilize the resources of [INAUDIBLE], the research has been done, and it is all out there. You just have to look and see what works.

Again, find those programs which produce results and those that--put most programs which have a profile under the programs which produce results, results being increased numbers of students taking these classes, performing well, going to college, and entering professions, gets the results [INAUDIBLE] and interact with the programs, come visit, observe, and share ideas in a dynamic interaction.

You can interact among agencies, we are starting now [INAUDIBLE] people doing this stuff are starting to work together, OK? We all need to work together. Agencies need to work together.

We need to provide a support network, and we have to do it now. We really don't have any time to waste. We have to act now so that a systematic support program can be forged, with all of us working together.

We can avoid fragmentation and duplication. We can share ideas and we can get the job done. I am confident of that, because it is being done in little bits and pieces. We just need to put it together so it works for everyone.

DR. REYNOLDS: Thank you very much. Ms. Winkler.

MS. WINKLER: Before you go, I think this is just the sort of exemplary program that we are going around the country to look for and get ideas about what does work. I think your comments are just right on target.

I have one question, which is how are students identified for entry into the program? At what age? What criteria are used? And do they vary from site to site?

MS. HUMMEL: They vary somewhat from site to site. Each district uses its own measure, and to some extent it depends upon individual advisors. We have an advisor in each school.

Jackie Stone--did I introduce Jackie? Oh, I'm sorry. Listen, Jackie Stone, please stand up. Jackie is the advisor at Westport, and she really is into students. She is really [INAUDIBLE].

She and Peg Jones work together to identify students for Westport. Part of that is interest. They are identified coming into the school.

MS. WINKLER: At what grade?

MS. HUMMEL: In the first year of high school, freshman year in the Missouri school district. But some high schools begin at ninth and some begin at tenth grade.

At this point we are starting with the first year of high school. They are identified by math performance, performance on the standardized tests, but not just that.

He has to be interested in the program. A meeting is held once the pool of students who might qualify for this program is established. A meeting is held where they and their parents come.

The program is explained and then they sign contracts, their parents sign contracts.

MS. WINKLER: What is in the parents' contracts?

MS. HUMMEL: It is the same contract, and they are saying that the students will take college prep course work and earn an A or a B in all their classes or else take advantage of tutorial support provided through the program, and then that they will go with all the activities, and take SATs, the SAT test.

All of the pre-college stuff that you are supposed to do. And there isn't--the parents signature is an endorsement in this case. The parent isn't required to do anything extra, other than endorse the program in which the student participates.

DR. REYNOLDS: Question from Dr. Scadden and then I will move down here to the left.

DR. SCADDEN: You indicated that there are tutorial services available. I would like to know who provides these services? Do they come from within the school? The community? Or wherever they are from, how are they paid for?

MS. HUMMEL: The program pays where it is necessary. And again, it varies from district to district. The Topeka schools have their own tutorials and those take place, they are provided by the school to be open at night.

Some of the Kansas City schools utilize industry personnel to come out to the location where we need the tutoring. Some programs use teachers in the school and some use upperclass students.

MR. CUMMINGS: Undergraduate.

MS. HUMMEL: Yes, and undergraduate college students also.

DR. REYNOLDS: Thank you. Dr. Fernandez and then Dr. Danek.

MR. FERNANDEZ: The student-type question, as you know, is similar to [INAUDIBLE] in the Southwest and California, MESA, which has been very successful and in good standing.

But one of the questions--two questions, one, would an extension of this program down to the mid-school, maybe even elementary schools work in your estimation?

And secondly, what's it doing to your parents? Are the parents being more involved? And supporting more? You know, what is the effect?

MS. CUNNINGHAM: Yes, our parents are being more involved. They see that we get to the places we need to go. They are really interested in the kind of tests we are taking, so we will be prepared before we leave high school.

DR. REYNOLDS: What about grade school?

MS. CUNNINGHAM: Grade school? I have a younger sister, and she is really interested in if they have MACESA when she goes up to my grade. My parents really want her to get into MACESA, too, because the grade school kids are not really prepared before they get to high school [INAUDIBLE].

DR. DANEK: Yes, could you give me a feeling for the numbers, that is, you have how many--MACESA goes to how many school districts in the state? How many people are involved? What is the average cost in running an average program per student--per year, let's say?

MS. HUMMEL: OK, there were 227 students in the program last year, and this year we are just getting the figures together.

DR. DANEK: That is across the whole state?

MS. HUMMEL: This is--we have [INAUDIBLE] schools in Omaha, four in Kansas City, Missouri, two in Kansas City, Kansas, one in Topeka, one in [INAUDIBLE], one in Manhattan, and two in Wichita.

It is a pilot program. We are not in all schools. [INAUDIBLE].

DR. ADAMS: Two years old.

MS. HUMMEL: Beg your pardon?

DR. ADAMS: It's two years old, right?

MS. HUMMEL: Yes, but as far as--we figure that one advisor can't handle more than 30 kids and do the kind of intense focus that is necessary in order to serve those kids.

But based upon 30 or so students per school, we figure it costs, including administrative support and all the field trips and [INAUDIBLE] for our program to the schools--about $6,000 per school per year.

DR. DANEK: Per school per year?

MS. HUMMEL: Um hum. That includes [INAUDIBLE].

DR. REYNOLDS: Thank you. Dr. Bishop, and then Dr. Hill.

MS. BISHOP: One question. You mentioned the contract that the student signs includes maintaining an A or a B. Do they always maintain an A or a B, or do you put them out if they don't maintain an A or a B, or how does that work?

MS. HUMMEL: If they fall below a B in a class, they must take advantage of the tutorial support. If they refuse to do that, they go on probation, and then after a probational period, they're out.

But if they really try, if they do their very, very best, and they are taking the right courses, and the advisor feels that they are performers, then if they earn a C in a class, they are [INAUDIBLE] in the program. They just have to be performers and they have to be serious.

DR. REYNOLDS: Thank you. Mr. Hill.

MR. HILL: Just a question about the financial support or other services provided by the school districts. What do they do?

MS. HUMMEL: We were established as a seed grant for magnets, and what we are doing now is trying to solidify a funding base. That's one. We have an industry advisory board. They are helping up to raise funds.

We also have a approached universities, university partners for some support in exchange for position on the board of directors and decision making perhaps with an input program.

And the same thing with school districts. We are in the process of asking school districts to pick up half the cost of the program per school, half the amount at the school. Kansas City, Kansas, sounds very favorable and we are just in the process of approaching them.

We feel like that if [INAUDIBLE], but the kids really--we had 32 graduates last year and all of them are in some kind of postsecondary education. Six graduates the first year--five of the six went into engineering and the sixth into fashion marketing.

Of the 32 this year, all are in some kind of postsecondary education, two-thirds in math and science or pre-engineering, and the others in military academy, one in a police academy, or having found that they don't want to be engineers, that they want an education.

DR. REYNOLDS: Thank you. It is a very impressive program. We wish you all success with it and we thank you.

I have just received unfortunate news that Dr. Stevenson has an emergency and will not be here to testify. We are going to do our best to arrange for him to testify at the California hearing, so the group is aware of that.

I would like to move on then to Dr. Edith Jones, Past President, National Medical Association. Dr. Jones, we thank you for being here ahead of time.

DR. JONES: Thank you. I appreciate the opportunity to present views on the topics under consideration here today. I could, myself, readily represent any or all of the categories, women, minorities, or even handicapped, which this Task Force is here.

But I respectfully limit my discussion to the assigned topic, "Inadequacy of the System for Acceptance of Women and Their Advancement on the Basis of Merit."

It appears that we are in agreement that though science and technology have made great advances in this country, various real and attitudinal continue to exist for the exclusion of women in their environment.

Equity of women for access to the careers in science and technology, retention and advancement, and keeping with merit is a difficulty faced by women, which deprives our country of significant talent in these areas.

And speaking of the system which operates for or against the representative participation of women in science and technology careers at appropriate levels, we will refer to the ideas, forces, practices, and the socioeconomic or political situations which interact to bring about existing conditions.

Progress has continued since women's suffrage, though not in keeping with the capacity of our country. Though the law reads equal opportunity employers do not exclude on the basis of sex and other irrelevant characteristics, it has not adequately changed the practices in those situations which lead to exclusion of women in science and technology careers.

Societal attitudes are engrained in almost every situation which affects the acceptance of women in science and technology. Beginning with the preschool fables, women are portrayed in roles which encourage women to view themselves as inadequate for careers in science and technology, and for the nonacceptance as professional equals by their males who dominant these fields.

They tell me that Snow White was [INAUDIBLE] with the keeping of seven dwarfs.

Too frequently, women are displayed as helpless, dumb, emotionally unstable, and presented chiefly as caretakers and support persons for others' careers and professional achievements.

Adequacy as a system to promote positive attitudinal posture to want women is lacking. Women are apparently viewed through a glass darkly and seldom face-to-face and never mind-to-mind.

Acceptance, merit, and ultimate worth are meshed in the problems of democracy, equality, excellence, and fear of mediocrity which lurk in the minds of some who guide the destiny of many people.

Increased greatness in this country could be achieved if the work power of womanhood was truly released, especially in science and technology. Some even argue that equity of women involvement would reduce the high level of competitiveness and excellency which exist in science and technology.

Textbooks and required readings for children must be analyzed and evaluated. Those who are prejudiced against sex are segments of our society without scientific basis should be eliminated from the accepted list.

The same idea should be utilized in dealing with the public media, relative to career choices.

There exists an attitude that reflects the concept that the increased mobility of women in science and technology fields would adversely affect our pattern of parenting. There are those who in this context express concern for the traditional family life in America.

Most of those who have been blatantly vocal have expressed their concerns selfishly. Women need not bear the entire responsibility of child nurturing, of discipline, and career makers, rather than participating, if they like, in careers.

Cultural, ethnic, and gender experiences have significant impact on the development of behavior and the social systems by which behavior is expressed. This is to say that experiences, behavior, and systems show relationships and their inadequacies in our system for influencing the attitude which promote acceptance of women in the male-dominated science and technology world.

Detrimental to the increasing number of women in science and technology is the no-win position for women in this area. If a woman makes it, she is labeled as like the few who always makes it in spite of circumstance she is special.

If she fails, that is used to reinforce the attitude that this was expected in the first place--woman can't do it. The adoption and dissemination of the public policy regarding women and their promotion in the area of science and technology, based upon merit, would greatly enhance the selection of women for careers in science and technology.

I hope that the efforts of this Task Force will terminate in the development of a public policy in the areas of concern.

The job will be complete when implementations are instituted to have improved representation of women in science and technology.

As I prepared for this presentation, I noted the members of this Task Force, and the position each has with his or her powerful organization, foundation, agency, or department, and I felt a great satisfaction about the time and energy I expended in preparing and coming to be a part of this effort.

If we can generate a spark of concern here for the previous policies and attitudes for the exclusion of women in science and technology, and can take that to all the individual entities the energy and information generated here, positive change will occur and will occur soon.

If we can make our firms, institutions, foundations, agencies, or organizations better, we can expect others to follow. You are the selected leaders to have change occur.

The adoption of public policies regarding women in the field of science and technology is needed in order to bring about the changes in the existing system. Obviously, there must be an allocation of resources, programming, and implementation of policies monitoring the implementations and evaluating the success and necessary amendment of those policies which are not affected in changing the same.

Role models could enhance the selection of science and technology as a choice of careers for women. The absence of sufficient number of role models dispersed geographically throughout the nation could well account for the selecting of science and technology of women as their life work.

A study of approximately 100 engineering female college students and approximately 200 students majoring in social sciences revealed that a significantly higher percentage of engineering students, rather than social science students, came from larger cities.

No explanation was offered for the differences, but I postulate that the role model concept played a significant part in the choice given.

Rural females with limited resources may have limited contacts with females in science and technology areas. These decisions relative to a career and to their feeling of lack of empowerment to attain some objectives are largely justified.

The opportunity to interact with a role model could provide that spark of enthusiasm which could spell the difference in the selection of a career.

It is interesting to note that at one predominantly black college, the majority of students coming from particular towns of the state majored in the same academic field, and investigation revealed that in each case where there was a cluster of majors, a strong role model existed in that area or subject matter in the high school from which the students came.

It leads to the conclusion that interest may be taught, but more significantly, it is caught from those who are enthusiastic and effective in their work.

A diversity of vocational [BELL] choices, and the choice of nontraditional fields as careers will require role models whose presence is convincing enough, and when role models do not live in an area, it may be necessary to bring in as career conferences and other role models into programs that will expose the students.

Research into the numerous factors which affect women and their acceptance in science and technology is inadequate.

Sexual harassment, assignment to subordinate roles, and exclusion from certain contexts, are some of the experiences which are frequently encountered by women whose science and technology could be careers.

Much of the research which we have now are done by male social scientists. I have presented to you areas of concern which I feel will enhance the participation of women in science and technology, thus improving advances already made, and making further advances.

These work:

Aggressively participating and having the societal attitude to watch the career role of women change, including attention to negative education and public media and information regarding women in stereotypical roles.

Formulation of public policies for hiring and promoting women and disseminating the same.

Availability of role models for girls and young women to aid in choice of careers.

Continued quality research in order to appropriately identify our [INAUDIBLE] which affect promising approaches for dealing with them, and a continued concern until the need for same no longer exists.

Thank you.

DR. REYNOLDS: Thank you, Dr. Jones. Dr. Jenkins.

DR. JENKINS: Dr. Jones, there is a perception abroad that no matter how difficult the challenges are that women face, that those problems are magnified for minority women. I wondered what your perception is and [INAUDIBLE].

DR. JONES: Having had the role of both being a woman and being a minority and being a black, handicapped by all of the attitudinal situations, I can certainly testify both by my research, by my contact with other minority women, and by a personal experience, that indeed they are magnified.

DR. JENKINS: Do you think anything special should be done for minority women to get them into science and engineering that would be different than what you would do for nonminority women?

DR. JONES: No, I don't think it needs to be different. I think it needs to be done at the same aggressive, and maybe more aggressively since we are so far behind as a result of exclusion and a lack of concern in the past.

DR. REYNOLDS: Ms. Winkler.

MS. WINKLER: Dr. Jones, in your own career, can you recall for us at which points were the key turning points when someone intervened to help you choose the career paths that led you to all your own achievements.

I think that would be useful to all of us.

DR. JONES: Probably in making the selection of going into health career was in my college days. But the fact that I knew that I wanted to go into a service-oriented kind of career in which I was to help people came very early, maybe even before I entered into formal education.

And it came from my family, from my church, from my community. It came from the extended family that, if you will do the things that are necessary, you can get yourself in a position to come out of the limited society in which you are having to live and also bring others out.

That was at a very early age, as I can recall now. I would even say as early as three years old I was being programmed, literally programmed by my family to move in a direction in which I could become the instrument by which I could help others.

MS. WINKLER: Thank you very much.

DR. REYNOLDS: We are now slated to take a 10-minute break. I would urge we restrict it to 10 minutes, and be back at our posts at approximately 11, excuse me, 10:47. Thank you.

[BREAK]

DR. REYNOLDS: I would like to move ahead now with Dr. David Wohlers, Professor, Department of Chemistry. Dr. Wohler. And could we ask everyone who testifies to please [INAUDIBLE] their testimony in the white box at the table there by the recording equipment.

Is Dr. Wohler here? Maybe not, all right.

Is Mr. John P. McTague here? We are going to move up and go to you next. Mr. McTague is Vice President for Research at Ford Motor Company.

MR. McTAGUE: Thank you for the opportunity to be here today. Believe it or not, the weather is worse in Detroit.

The industry that I am in now, the automotive industry, is the subject of, as you know, very fierce global comnpetition, probably as fierce as any industry worldwide.

We need every lever we can get, just in order to survive. We are under siege in areas of quality, in areas of cost. In order to have a competitive advantage in these areas, one of the clear things we need is technological capability.

This technological capability has two legs to it, one of which is having a technically literate work force. The other of which is having a technically capable research, development, and engineering force.

I do not believe that these two can be separated, either in the actual work force or in the development of these skills.

We are clearly concerned over the absolute numbers of minority graduates with technical degrees, even though some progress has been made. In 1975, 3.8 percent of total graduates with bachelors degrees in engineering were minorities, and by minorities, I exclude Asians.

In 1986, this had increased to 5.3 percent of total graduates.

Women graduates with bachelors degrees in engineering, on the other hand, increased from less than one percent in 1970 to about 14-1/2 percent of total graduates in 1986.

These statistics indicate some definite progress, but they also point to a potential competitive advantage for this nation which is as yet incompletely tapped.

At Ford, there have been many actions recently taken to improve the situation, both unilaterally and in concert with other organizations. During 1987, the Ford Motor Company Fund will provide over one and a half million dollars in direct monetary grants to support minority programs across the country.

But I don't believe that that is the most important aspect. I will begin with some of the programs that I am most familiar with, and those are the ones that are carried out by the research staff.

Several years ago, we began a high school science and technology program, held on Saturday mornings for high school students who have an interest in science and math. The program also provides science teachers a contact with industrial science.

Most sessions combined a lecture and a demonstration, along with tours of various laboratories in our scientific research lab building.

The program is run on a voluntary basis with much enthusiasm by our staff members. Minorities and women participate in the program.

We have recently instituted an ongoing summer program with Radcliffe College for women who are studying engineering or science at the junior or senior level. We expect this program to be of mutual benefit.

On a company-wide basis in 1987, through September, more than one-sixth of our technical degree college graduate hires were minorities, and almost one-fourth were women. These numbers may sound heartening, but they represent rather small absolute numbers since our company is becoming leaner.

We have almost 40 percent less salaried employees now than we had in 1979, although we are producing as many cars and making a lot more money.

The largest challenge will be sustain these numbers in percentages as we begin to replace our aging work force over the next decade. I do not believe at present that we could sustain these percentages with the same quality, considering the availability out in the marketplace at the moment.

Thus, it is in our own self-interest to try and nurture the pipeline. One of the ways we do this is in terms of company co-op and summer intern positions.

In my written statement, there is a description of a number of efforts that the company is involved with to improve on a long-term sustained basis representation of minorities and women graduates in engineering.

They are at both the national and the local level, and involve both pre-college engineering programs and in-college programs.

Perhaps the most intriguing and most successful one is one that you may have heard of, and that is the Detroit Area Pre-College Engineering Program, otherwise known as DAPCEP. The objective of DAPCEP is to increase the number of middle and high school minority students who are prepared academically to choose careers in engineering and technical fields.

It pools the talents and resources of parents, Detroit public schools, industry, and six area universities. Specific segments of the DAPCEP program include in-school projects, a sanity program, and a summer skills intensification program.

Ford has been involved in DAPCEP since 1978. About five years ago a Ford employee served as Chairman of a reorganization task force that brought DAPCEP incorporation status. He then served as the first president of the DAPCEP board of directors.

Several minority engineers from Ford serve as speakers in mathematics and science classes to help students to understand what kind of work is done in industry by people with science and engineering degrees and to act as role models.

We will have 25 DAPCEP students attend the Saturday classes this year, conducted by our research staff, that is, attend every week.

A recent survey indicated that 74 percent of the current DAPCEP alumni who are in college are pursuing engineering, math, or science majors--absolutely remarkable percentage.

An impressive 81 percent of the college graduates of DAPCEP have pursued majors in these fields.

Another measure of success of DAPCEP has been the increase in the number of science fair entries from students in the Detroit Public Schools. The number has increased from 222 in 1977 to 1,009 in 1986. Of these 1,009 entries, 756 or fully three-quarters were from DAPCEP students.

From a qualitative standpoint, DAPCEP students had 15 gold ribbons, or 60 percent of the total, and the grand award in 1986.

I think DAPCEP qualifies as a truly inspirational program. The thing that makes it inspirational to me is that it is a team effort of industry, the Detroit Public Schools, six local universities, and probably most important, parents.

As indicated in my written statement, Ford has supported local efforts in six other geographical locations where we have Ford plants. At the national level, we have been a major contributor to the National Action Council for Minorities in Engineering for over 10 years.

The major portion of NACME funds is directed for scholarships for minorities interested in engineering or science at selected universities. They also provide professional assistance to local organizations to develop programs to strengthen the retention of minorities in engineering.

While Ford and the rest of the corporate world continues to increase their efforts in support of minority programs, much needs to be done to ensure that the industrial technical work force benefits from the talents of all segments of our society, particularly women and minorities.

Although women and minority engineering graduates have increased, there are still far too few to meet the demands of industry. The situation with advanced degrees is even worse. While the number of women entering graduate school is rising, up almost eight percent between '76 and 1984, there is a critical undersupply in the fields of chemistry, physics, and engineering.

In closing, let me enumerate a few areas that need to be addressed.

One, more creative programs are needed to increase the availability of minority and women technical graduates.

Two, better efforts are needed to retain women and minorities in engineering and science, once they have enrolled.

Three, university summer enrichment programs for high school students and summer intern programs should be increased. [BELL].

Four, there is a need for parents and educators to encourage pre-college efforts in math and science further down in the elementary levels, to build a better foundation for the courses they will receive at the middle and high school levels.

Five, a major effort needs to be dedicated to enhancement of curriculum and teacher skills in math and science at all levels in the K through 12 programs.

Six, we need to develop programs that encourage American-born students, including minorities and women, to enter graduate schools in science and engineering fields.

And finally, as has been noted earlier, we need more role models and critical masses at all levels, from the boardroom to the grammar school classroom.

Thank you for your attention.

DR. REYNOLDS: Thank you, Mr. McTague. Could I clarify just one point. Ford has 40 percent fewer employees now than it did in 1977.

MR. McTAGUE: '79, thereabouts.

DR. REYNOLDS: And yet you are making the same number of cars?

MR. McTAGUE: Yes, ma'am.

DR. REYNOLDS: That is due to increased automation.

MR. McTAGUE: Increased automation, increasing cooperation on the part of the work force, and increasing technical skills of the work force.

DR. REYNOLDS: And the net effect of this, since your intake level has been higher for women and minorities--I just needed to have those numbers run by me again.

MR. McTAGUE: I don't know what the net increase is since '76. I only have the figures for this year. The figures this year are that 24.6 percent of our technical degree graduate hires were women, and 16.6 percent are minorities, that is, excluding Asians. If you included Asians, of course, you would get a very tilted view in the areas of science and engineering.

DR. REYNOLDS: Thank you very much. Now we have a lot of questions. I will start around the room. Dr. Clive.

DR. CLIVE: In those seven areas that you ended your presentation with, do you see a role for the federal government in encouraging any of those, and if so, what role? And if not, why not?

MR. McTAGUE: Having worked for the federal government, I am usually leery of it. On the other hand, I think, in particular, support of summer enrichment programs at unversities at a more expanded level would be very useful.

Continued support of curriculum development tools for ordinary students, not for exceptional students. I think the whole system has to rise in order to increase the pool of those that we can label as having the important skills in science and engineering.

I think those are the major areas where I would like to see increased federal support.

DR. REYNOLDS: Thank you. Next question, Ms.

Hanshaw.

MS. HANSHAW: With regard to the women and minorities when they enter your work force, do you have any need for, and do you have any special programs to help them get promotions in adequate time, to advance in other ways within your work force? Or do they just fit in right away?

MR. McTAGUE: Some fit--of course, there is a spectrum just like there is for people in general. There is a spectrum, but there is a concerted effort, and from my own point of view, having only been there for a year and a half, a very impressive effort, at trying to identify the individual needs of, and individual opportunities for all of the salaried work force, including women and minorities.

There is, as I personally know from my interactions with the Chairman, the Chairman is particularly concerned that we aren't getting enough out of this potential source of talent, and he looks for opportunities for promotion advancement, development courses, et cetera.

It is not a formula thing. I think in past--the over attention to meeting numerical goals has resulted in not being quite honest with everyone in the system, to the detriment of the system as a whole.

But I think that is changing, mainly because we need every piece of talent that we can get.

DR. REYNOLDS: That is the big point. Dr. Scadden.

DR. SCADDEN: Yes, I have a couple of quick questions on the program in Detroit, is it DAPCET?

MR. McTAGUE: DAPCEP, yeah.

DR. SCADDEN: How do you spell that? And what does it stand for again?

MR. McTAGUE: It is Detroit Area Pre-College Engineering Program.

DR. SCADDEN: It sounds like it could be one of the exemplary programs that we would like to take a look at, as far as I am concerned. I would like to know how that is funded and then the second, and probably the most important question, you indicated right now there is 25 students on a regular basis this year.

What would be your recommendations of what would have to be done to increase that number to 50, 250, 500, 2,500?

MR. McTAGUE: Oh, I'm sorry. Those are 25 who come to the Ford Scientific Lab on a Saturday morning. That doesn't represent the size of the program at all.

DR. SCADDEN: Right, OK.

MR. McTAGUE: That is a small faction of the total.

DR. SCADDEN: That is helpful, but could you elaborate a little bit of what would it take to increase that number so that we really can reach a larger number [INAUDIBLE]?

MR. McTAGUE: I think probably as important as anything else is getting local organizations, local industries committed to programs like this. The Detroit area has been very effective in doing that. A large number of industries have, are involved in these programs, and they provide the major source of the funding for this program.

I would like to see this thing cloned in just about every large city in the country. I think it could be very effective, but it takes local commitment of industry.

DR. REYNOLDS: Thank you. Anymore around here? Back to Ms. Sonia Walgreen, and then we will keep moving.

MS. MEJIA-WALGREEN: Let me question you a little bit further on this DEP program here. You said it was more than the 25 students--I put down here 25 students. How many students do you have? A thousand, 2,000?

MR. McTAGUE: Well, let's see, if--I don't know the exact number, but I believe I gave you a number for entries in the science fairs. That must be a reasonable approximation to the number.

In 1986, there were 756 entries in the science fairs from DAPCEP students.

MS. MEJIA-WALGREEN: OK, so we'll say something like 800. Now do you have any idea how much it costs to fund these 800 students?

And then let me ask you another question. I have here a note that says, this is an after school program, a summer school program, intensification of skills type of program...

MR. McTAGUE: And in classroom.

MS. MEJIA-WALGREEN: And in classroom. Does this affect all 750 of them?

MR. McTAGUE: Yes, ma'am.

MS. MEJIA-WALGREEN: Does Ford foot the bill? And I still would like to know, at least a ballpark figure, what is that bill?

And then you also said that there is a role for the universities. What is that role?

MR. McTAGUE: Universities provide experiences for the students to visit. They give them lectures. In all of these programs, there is simultaneous involvement of the teachers of these students, which I think is also very important.

To give you an idea--you asked about money--I don't know what the total cost of DAPCEP is, but I will find out for you.

MS. MEJIA-WALGREEN: I would appreciate that.

MR. McTAGUE: I know that in 1987, Ford contributed $40,000 toward it.

MS. MEJIA-WALGREEN: OK, and there are other businesses, you said, that are involved in this program. I would appreciate some sort of figure on total costs of a program of this nature.

MR. McTAGUE: I will get it for you.

DR. REYNOLDS: Thank you. Ms. Bishop.

MS. BISHOP: I just have one question. I am more interested in employment. If you are saying that, and I know you can only speak for Ford, but if you have lost 40 percent over the past decade, and assume that your program does catch on in a lot of other areas, should I be worried about whether we are going to have an overabundance of highly technical skilled persons who can't find jobs because of the work force that is in the decline, or are you looking for a different type of work force in the automotive industry?

MR. McTAGUE: I think in many of the so-called "mature industries" in this country, what in fact we need is a more effective skilled work force, not just at the bachelors and Ph.D. levels, at all levels.

Statistics in general indicate that introduction of technology in fact increases employment in total. It may not increase it, for example, in our factories. It increases it, in addition, in our supplier base, et cetera.

One of the reasons why we, in fact, have lower employment now--one of the reasons, although not a major one--is that we are making use of some of the talent that is elsewhere. We are not just trying to do everything ourselves.

So many of our suppliers have increased their capabilities.

But I think we are very, very far--and I am not sure it is even possible to reach the stage where the work force would be overskilled.

DR. REYNOLDS: Mr. Oaxaca.

MR. OAXACA: I'm very interested in your thoughts for the Task Force. I happen to be in the aerospace business and one of your elements is also.

What I do notice is that to a large degree the nation does not really view this as a major issue, has not recognized and appears to be that it is too long a term type issue. What would you suggest for this Task Force that industry working together could do to highlight this to all the folks that are running for president, so that this becomes a national agenda?

You know, should it be an advertising campaign? A full-court press by the different industry segments? How do you get the nation turned on like they got turned on to go to the moon?

MR. McTAGUE: Well, I think one of the remarkable things that has occurred in the last year and a half is that everybody in the city of Washington can pronounce a five-syllable word, which is competitiveness.

I think at this time the CEOs of respected industries have leverage, public leverage that they have not had for a long time and that they ought to utilize in terms of articulating the educational needs in order for this country to maintain its prosperity.

I know our Chairman, in fact, has done that often. We are seeing it in the cases of many other CEOs, the Council on Competitiveness, the CEOs who are on that have been particularly vocal.

But I think it is important that this be sustained and the country as a whole will listen to these people and I think in particular the presidential candidates in this era of competitiveness are a susceptible audience.

DR. REYNOLDS: Thank you. Incidentally, for the members of the Task Force, we will get a copy of the DAPCEP plan, so if there are any more questions relating to that, I think that we should hold that until we get a copy of that.

I'll keep moving along, Dr. Danek.

DR. DANEK: Yes, I am struck by what you said and by what a lot of other people have said, and it all comes, it seems to be that it is not so much a matter of the money, we have the money. What we have are--it is a matter of getting people together, getting them interested, getting--capturing their imagination, and beginning to give them examples, in effect, cloning DAPCEP and other ones that we have seen today.

How would you suggest that this committee go about doing that exactly, getting some of these programs cloned? And what would Ford be willing to do to help to capture the imagination of some of the CEOs in this country?

MR. McTAGUE: Well, you have a platform that can be very effective, I think. Several years ago, you will remember, a report that came out that was entitled, "A Nation at Risk." It got on the front pages of every newspaper in the country.

A carefully articulated statement on the part of this group that is documented could have broad impact.

Attempting also, in addition, I think, to contact industrial groups such as the Business Roundtable, the Conference Board, there are several others, in terms of trying to open up a dialog, I think, could be particularly effective.

I think the CEOs are very interested in this activity, this class of activities, and would be more than willing to work in concert with you.

DR. REYNOLDS: Dr. Clutter.

DR. CLUTTER: I just wanted to say for the benefit of those who don't remember Dr. McTague in a former incarnation, when he was the Science Advisor to the President of the United States just a couple of years ago.

DR. REYNOLDS: Thank you, Dr. Clutter. Ms. Winkler.

MS. WINKLER: Just one last question. One of the things you mentioned was the concern about the whole school. One of the interesting areas that corporate leadership seems to be getting into now is what kind of clout they have in both the school systems, to make things happen, as opposed to simply [INAUDIBLE] on a very supportive, not equal role that they have had to date.

Is Ford doing anything in the school systems where it [INAUDIBLE] its employees, to try to do something about improving those school systems in general, and can you tell us what, if anything, is being done or planned?

MR. McTAGUE: I am not fully cognizant with the full scope of the activities across the country, of course, there are very many plants in very many areas. I am more familiar with what occurs in the Detroit area, where there is substantial personal commitment on the part of--not just the CEO, the CEO is only one person. He has leverage, but he is one person.

The individual employees are involved a lot. I know, for example, in my own laboratory, there are several people who are on local school boards. I know we have this volunteer program.

There is involvement in an adopt-a-school program in Detroit. There are lots of little things going on. I don't know any magic levers. I don't think anybody else does, except for the fact that personal involvement is the most important thing.

It isn't money. Money helps, but it is personal involvement and commitment that matters. And in particular, I know that our CEO has commented on this several times.

DR. REYNOLDS: Thank you. Mr. Hill.

MR. HILL: With the recent dive in the stock market, what is the impact will corporations have in terms of contributions to DAPCEP and MACESA and all these other programs that you support in 1987 and in the future.

MR. McTAGUE: I can't speak for other corporations, but I know that our funding plans are independent of the stock market or of the profitability of the corporation. To first approximation. The intent is to keep these on a level, on a steady keel, and not have enormous ups or downs.

That being steady and consistent is the most important--one of the most important things when you are aiming at a long-term goal.

DR. REYNOLDS: Thank you. Other questions? I would like to ask you, Dr. McTague, you are hiring a lot of graduates, a lot of women and minorities in the sciences. As many of us here come out of universities--and you did, too--are you pleased with their level of preparation? Are there ways you wish they were differently prepared?

Any comments or thoughts on that? And we won't hold you to these, just anecdotal.

MR. McTAGUE: One of the things that has really struck me--I visit probably one university campus a week, on average, usually to engineering schools or departments.

And one of the things that has struck me very positively has been that at a very large number of schools, the very best engineering undergraduates--the very best--the leader in the class, the president of the engineering society--is a woman, which indicates that there is tremendous untapped talent out there that we are just starting to tap.

Of our own hires recently, I would say that, at the doctoral level, which is the area that I am most personally familiar with, since I interview all of them, the women that we have brought in have been truly exceptional, truly exceptional.

At the doctoral level, there is a disgraceful, disgraceful for our society, paucity of minorities, in particular blacks, in the engineering and the science areas.

We just can't afford to let that talent go away.

DR. REYNOLDS: Thank you very much. We will proceed on--thank you for coming--to Mr. Nate Thomas--is he here? Good, from the National Association of Minority Engineering Program Administrators. Mr. Thomas.

MR. THOMAS: Before I get started on my own testimony. I have been sitting there squirming in the seat because Kenneth Hill, the Executive Director of DAPCEP, who I helped form that group with in 1978 in a conversation with Dick Rosensteel from Ford, at the time, could have answered the questions that you had.

Those are day-to-day types of things. And also another response--I hate to do all this before I get started, but I am hearing something--role models and models of programs and things.

And as I sat there I thought about, of all the programs that I can think of in the one minute there I could write down that you would want role models of, you would have the CAPCEP program out of Chicago, DAPCEP in Detroit, SECONE [PHONETIC] in the Southeast, the MASPEP program in Boston, PRIME in Philadelphia, PRISM in Rochester, New York, the MESA program in California, Colorado, Washington, and Baltimore--all of which are totally different from one another.

CIC Plus in the Midwest, TAME in Texas, C&SP in New York, BEAM in Buffalo, MACESA that you just heard about, the

STEP program in Hoboken, New Jersey, and the TIME program in Rhode Island. I didn't want to write down the Gateway in Milwaukee and other programs.

My point is that there are many, many programs out there, and modeling is not necessarily the answer. I also don't want to get into an extended discussion about my own school, Illinois Institue of Technology.

I have turned in some information. At the end of that, you will see that over the past 11 years I have graduated 501 minority engineers and I have got some other sheets you will see that have their cumulative grade point averages by discipline.

And I don't think--and the percentages--and I don't think any, particularly non-black school, non-minority school could compare with these figures of this small private school I am functioning in. And I will leave that because the meat of my discussion revolves around the things that are happening and have been happening over the period of time, over the last number of years.

And I want to speak directly to the subject of blacks, Hispanics, and American Indians in the field of engineering.

The National Association of Minority Engineering Program Administrators, commonly called NAMEPA, is the only organization whose members work directly with this class of student over an extended period of time, encompassing a full-time commitment to the task of pre-college preparation, college enrollment, retention, and graduation, and assistance in entering graduate school or the work place.

Since the Blueprint for Action by GE spelled out the problems of minority student preparation for corporate America and its environs in 1972, many of our NAMEPA members have labored in the field probing, analyzing, researching, and experiencing the various problems and the ways in which minority students succeed or fail to succeed in the disciplines of engineering, science, and technology.

Over 450 of we NAMEPA members from every part of the U.S.A. have met, networked, and shared our data and experience in this area. As immediate past President of NAMEPA and for the past 15 years the Minority Engineering Program Admininistrator at Illinois Institute of Technology, and in the Midwest, I can say that no group is more qualified to make recommendations to this body, based on synergistic experiences, which one never gets if their position restricts them to a singular view of only the elementary school, only the secondary school, or only the college environment.

These people work across the lines and they see the students go from one step to the next step. My personal view is that we need to look at some alternatives to the present system of education, and to recognize that the public educational system, as practiced in urban America, where large minority populations reside, is basically a failure.

Furthermore, our so-called colleges of education in urban areas are even greater disasters because of their failure to adequately prepare teachers for urban schools, which borders on the criminal.

In that regard, degree by mail diploma mills from which master's and Ph.D. degrees are literally bought should be outlawed, or at the very least be unacceptable for teaching credit.

And I don't think there is any use of teaching more and more of the things we are talking about if the teachers are certifed but unqualified to teach the subject matter. And this is one of the things we have to deal with an urban environment to begin with. More of that education is no good for anybody.

Now lest you think that I believe all of the problems are with teaching, that's not true. I am sure there are some of use could point fingers at parents, role models, diets, self esteem, et cetera.

But these things tend to be highly individualistic rather than being built into the system, as the teachers are. I can spend the rest of my time and yours telling you about the problems, which I am sure you have heard more than enough of in the hearing, so I would like to suggest some of the following solutions, for discussion.

One, save a lot of tax money by not studying or researching this problem any more. Simply take advantage of what has been done successfully over the past 15 years by numerous programs and put extra emphasis on results, and I think you heard about that this morning, and NAMEPA can help in that regard.

Number two, while support is given to short-term efforts and results, especially those which emphasize partnerships between elementary, secondary, and college entities which work effectively with industries and other groups outside of the normal structure, develop long-term efforts to restructure the system.

Three, don't become enamored by large numbers of participants in a particular program effort. Our experience shows that a quality program at whatever level emphasizing the individual talent will be more productive in quantity over the long term. So 3,000, 4,000, all that's not as important as what do you get in the bottom line, in terms of graduating and things, and you will find that there is kind of an inverse relationship for those numbers.

Four, neither public nor private colleges have a monopoly on success, and although involving big names with big titles from big organizations may be politic, it is usually no name, little people from unknown locales who have been getting the results. Find out who they are and use their talents. I think that this hearing will do much in that regard.

Five, recognize that college faculty members from numerous colleges do an excellent job of teaching minority students, but most know little about the noncognitive variables that affect the learning patterns of minority students, and even less about running special programs. The tendency is to do what they know best rather than what the minority students need, which means a psychologist will give the students all the psychology in the world.

An English professor will say, well, English is important. And they never look at what the students themselves need.

Six, develop multisystems or approaches for solution. There is no one model that will work for everyone, and even in seemingly similar situations. For example, a pre-college program in Detroit, such as DAPCEP, outside of the public system, must usually involve busing, because there, since there is such a large automobile business, there is no major transportation system.

So a lot of money is spent in the program busing kids from one place to another. At the same token, in Chicago, the same program could involve public transportation, so you don't spend a lot of program money on getting there and back.

Now if you just look at the program itself and don't realize that, you take off in a whole different direction, say, well, they both got minority populations, then they are similar. They are not.

Seven, let people who have experience in special programs in the subject areas assist in reading proposals. They are less likely to be overly influenced by a slickly written proposal and more aware if the experience and know-how are present to produce a given result.

There is more to an effective program than pedagogy. It is more than just teaching. And if you look at it that way, we will continue to have failing programs. There are some other non-cognititve things that are there.

Eight, we need long-term, short-term, and intermediate programs and a lot of communication between them as well as sharing. Since there is no college course to train effective program administrators, any effort to train these highly mobile people will lend more long-term stability to an effective effort at the federal level.

Nine, set up categories for funding programs. As an example, Category A would be for new program efforts, those people who are just starting and want to do something in the subject area.

Category B, those with five or more years of previous experience, because until five years you really don't know if you have an effective program or not. The tendency is after five years if you have got all these people hired and all this program going is to declare yourself a success and ask for more money, whether or not the results are there. And that tends to be prevalent.

And C, I would say those with 10 or more years experience. Somehow they have been surviving, but those programs must be kept going. The CAPCEP program in Chicago just went out of business two weeks ago. Nobody cares or knows, but that was an effective program. But it is gone now because of lack of funding.

But I say why waste big dollars on amateurs? It doesn't make any sense.

Ten, recognize that women, minorities, and the handicapped have totally separate needs in successfully negotiating math, science, and technology careers. In some cases, the only issue is information and motivation.

In some, the environment might make a difference. In others, education or some combination of the the three. There may be a need for a program within a program in some cases, such as minority women within a women's program.

And that is the 10 things I have. But until we recognize that systemic change is a long, slow process [BELL] and that dollars committed must reflect this, we will fail to impact scientific and technological education of the general population.

While this long-term process continues we must provide viable alternatives for those young people currently being chewed up mentally by this dinosaur we call public education.

Finally, recognizing that the state is responsible for education, I would support state-federal partnerships in the subject area, but I would not support the funds coming to the state to be doled out to the appropriate grantees, many of whom would be the same people who caused many of the problems.

If there is to be no quality control in programs, or recognition that learning takes place in different ways within individuals, then these hearings will be blind to the realities of how today's young people function in the learning arena.

NAMEPA has a 15-year head start on you and we are willing to share our knowledge with anyone who wishes it as we currently do with NACME and with the NAPP, which is the pre-college professional group.

Thank you for allowing me to give you my perception anyway of what I have been doing for the past 16 years, and I have asked for it now.

DR. REYNOLDS: Thank you, Mr. Thomas. We enjoyed that and it had spirit. Do we have questions? Ms. Bishop.

MS. BISHOP: You came on strong about the alphabet soup in the beginning, about all of the programs across the country. My impetus is to say, well, if you have got all these programs going, what's wrong.

I mean there is something that is not working out there if you can sit here and rattle off all of the alphabets across the country.

MR. THOMAS: That's some of them.

MS. BISHOP: Some of them. But there is something--something's wrong, and I don't know--could you help me to put the finger on it. Is it that there is not a common thread? That there is no oversight, there is no linkage between the groups?

MR. THOMAS: No, let me try, let me try just a little bit. I'm so glad you asked that question. I have been praying for this.

MS. BISHOP: Well, I was going to ask you that before you got started.

MR. THOMAS: One of the problems is that people who have big names and titles get all the attention. These are little people. You heard Karen sitting here telling you about $6,000 per program. That's peanuts to you guys.

But to people like us, that is a lot of money, because we can't walk into NSF. We can't walk into the Department of Energy. We don't have the name.

And we don't have these huge bunch of people sitting at a college who do nothing but write proposals for us. We have to write our own proposals. We have to go out and hunt students ourselves.

We have to do it all. So you don't hear about, you don't go looking for us. When you go out looking for somebody, you look for the superintendent of a school system, or you look for somebody in the college who is the dean of something.

Those are not the people who have to do the work every day. So, and the other thing is that we started this effort back in 1972. We have been trying to talk to the federal government for 15 years and couldn't get anybody but the Department of Energy to even listen.

So these hearings are the first time--so Congressman Dymally holds a hearing four years ago, say, well, gee, I think it is interesting to have a meeting on technology and--we've been doing this stuff for years, and the person who is right there, Mel Thompson, advising him was the Executive Director of NACME.

And when some of those people talk, they don't talk about the Karen Hummels, they don't talk about the Roberto Reyezes at Rensselaer, or some of these other people. I could go on--I don't want to drop names, but there are people who are doing things all around the country, and these hearings provided the first opportunity to have you join us, because a lot of this stuff has been done. It just needs to be expanded, and the companies have been supporting us.

And we need some bigger dollars to do that now. We have experimented. Now it is time to get serious.

DR. REYNOLDS: Dr. Adams.

DR. ADAMS: I think, as an aid to that, one of the pieces of paper that you are going to get--I just summarized for over the past, since 1973, and you will notice that enrollment has gone up, and I think you can trace that almost directly what has been going on in the minority engineering effort.

As a matter of fact, in 1973, there were 8,558 minority students in engineering. In '85, there were 36,000. So the numbers have incrementally gone up, both absolutely and percentage gains.

As a matter of fact, percentage gain is more than double. But that's not the story. I think one of the things that you have to hear from what has been going on with these efforts here, when you talk about programs like the DAPCEPs and MACESA--I happen to travel all over the country to see these people--is that these are one-shop persons.

And whenever we start evaluating, we go back and evaluate because, well, you don't have quantifiable data. Well, I mean Nate has to raise his own money. He has got to do all the recruiting, he has to train his people, represent his president, go represent the dean who doesn't want to go to any of these meetings.

And so when you start talking about that, it just doesn't take any time. And I want to throw one plug in here, Nate, and then we'll come--I want to ask you a question--but I think it is important to get this piece up on the table, because at least if you want to look for a model that has been doing this.

The minority engineering effort cuts across teachers. We go into school districts where they don't teach calculus, and they now teach it. That is a whole different kind of concept. I think you heard that from MACESA.

I mean they went into schools where there was no calculus being taught to anybody. This is not just minority students. They weren't teaching calculus at all, and now they now teach calculus.

They didn't have advanced physics for anybody, white, minority, or anybody else. And they now teach that.

I think that's what we are trying to say, it's doing more than just doing that. It sets up a model of doing a whole series of kinds of things that have made a very good impact.

Another piece I think we can learn from the minority engineering effort. When you start quantifying what we are talking about, we did our, this, what we do at the graduate level. For instance, if we look at what the National Science Foundation's cost is for producing a student. Their cost is double what we do.

For every student they would produce, the cost is twice as much as what we do with the money we have in the GEM program.

And yet we can't get any money to do the same kind of thing with. We don't get any money at all. You asked a question about how can we have more people going to graduate school, for instance, OK?

We have a program to send people to graduate school, but there is not enough funding to fund that, so we fund only one out of three students who qualify to go every year, for lack of money, when the cost is half of what it would cost if you were going through some other kind of program.

And you cannot get that on the national agenda. So I think one of the things I was going to ask you, Nate, is, say to us, if you would, two things. One, how can we help you? Or can a group like this, I ask myself now, help you get this on the national agenda?

What I mean by that, how can we get into the dean's council? For instance, I am going to the Council on Graduate Schools tomorrow. They will talk about graduate education, and there is no place on that program for us, and we are the only program in the country that is running this kind of effort.

And we weren't even invited to the table.

MR. THOMAS: The only time that the deans or some of the other people at the college will recognize as a priority is if what, if their funding is contingent and dependent upon them getting that money or that funding.

There are many colleges that do not have a minority engineering effort. We talked about dollars. People will say cost per student per program, let's say, a pre-college program.

I wouldn't give you the total amount of money it cost me per student in a pre-college program because it doesn't mean anything. I could say 50 cents per student, so what?

I can tell you, however, it cost me $16 to produce each engineering graduate. That encompasses my college program, my pre-college, my retention, my--that encompasses everything, and it costs me $16.28 per student to produce that information.

But starting to look at pre-college in the isolation doesn't mean anything, because that is not an endpoint.

Getting to these other people that are there, the ASEEs and other people, NSF funds them, Department of Energy funds them, Defense funds them, and there is never a minority piece. So if it takes a low priority, particularly nowadays, then nothing is going to be done.

And I think those of you who are there have to reach some of these people, and to start telling them that it is important.

DR. DANEK: Would you be willing to provide a list of all the programs that you think are important in the country, that are doing what you feel is important, along with all the names of all those people?

MR. THOMAS: Well, I could provide you a list of programs. I think another thing you have to consider that hasn't come out here. There are good programs, there are bad programs.

Because a program exists doesn't make it good, and there is an evaluative process that there is no way that a panel such as this can evaluate a program, and believe me, and I am not trying to berate the panel.

But there is an experience you get in these types of programs--you have got to know the right questions and you have got to know what to look for.

You could have sat up here all day, but nobody would have asked the man from DAPCEP how do the students get to and from the program? That's just, that would be in the back.

The other--Honeywell is involved in a program. Part of the DAPCEP programs bring students to Honeywell during the week to do some things right with company people.

So a list I could give you, all right, but I am afraid you might misuse the list. That's what bothers me.

DR. DANEK: Would you rank those programs?

MR. THOMAS: No, no, you're missing the whole point. There are efforts...

DR. DANEK: I know.

DR. REYNOLDS: He's teasing you.

MR. THOMAS: OK, yeah. There are efforts, though, there are a lot of good efforts going--even a bad effort beats no effort. There are some programs out there that should be put out of business, but it is better to have them than not to have anything, and those things need improving.

I am saying that you don't need to start a whole bunch of brand new efforts and new initiatives until first you have looked at making sure that those things that are productive--and be very hard on productivity.

If you say you are going to produce students who are going to go into the engineering field and you are working with 4,000 students and only 10 students are going in, you cut that thing out or revise it because that doesn't help anybody.

DR. REYNOLDS: Mr. Fernandez.

MR. FERNANDEZ: There is something wrong in how we are approaching this whole problem, I think, because your programs that have been so successful throughout the country, my understanding is that you go out and get funds from the private sector [INAUDIBLE], and yet...

?: Excuse me, could you speak in the mike, sir?

MR. FERNANDEZ: In your point you made about educating the educated [INAUDIBLE]. I think it is a major problem, but in each state we are spending about 75 percent for our state budgets for education, both higher education and public schools.

When you get in the successive programs--do you have any bright ideas of how we can leverage the states or the federal government to bring all these ideas and couple them, from university to the public schools to any kind of schools.

MR. THOMAS: Yes, you require them to form the same types of partnerships. I am only extremely familiar with the state of Illinois. Like Howard, I travel around the country a lot because I am very interested in what happens, and I do consulting at a lot of colleges about setting programs up and I help as much as I can.

But when you get to the state level--in Illinois right now there is a problem with the teachers' salaries. So the obvious thing is to throw it into that till. You have to require them to interact with agencies and people outside of that system because it is only through the partnership, I believe, that we are going to be able to resolve the problem.

And if you listen to everybody, you've heard me--you have been listening to partnerships that are being formed by these different types of things.

The state--we are not politicians, basically. Many of us, unlike Bob Fennell in California, who runs to the state of California and gets some money for MESA. But that's not the whole answer either, but that's a part of it.

And many of our people don't even have the time to do that. Howard said, these are one-person shops. If you look, I will tell each of you, in your states, you want to see whether you got results or not.

The federal government spent a lot of money, starting in 1972, on medical education. At the time, and I can only look at this study of the National Achievement Scholarship Program, where black students showed at the time seven, I think it was seven percent of black students who were achievement scholars, who were easily admissible to college, were going into medical school.

The federal government threw some money in--I'm sorry, that was 11 percent. That number jumped to 13 percent, the support continued. That number jumped to 16 percent, back to 13 percent, and has continued at 13 percent for the last 15 years, and it has not changed whatsoever.

On the other hand, there has been no federal support going to engineering programs, but there was seven percent of students going into engineering in 1972, and now there is as many as--it has been as high as 43.8 percent of those students going into engineering, without any federal money at all.

Can you think what would happen if federal money had been going in? And on top of that, you look at the states in which those students are coming out of there, and quite often they are not the states that have these big glorious pre-college minority programs.

You have to look at some type of results that are there. Some states have increased and some have kind of remained the same, and I use that in terms of evaluating what is there.

But the partnership is the answer, but the local state officials have to somehow, unless you hit them in the head, they are not going to do it. They are not going to work with--the state is most influenced by the state universities.

The state universities in the United States may or may not have an outstanding minority effort going. They may claim they do, but you put their feet to the fire in terms of evaluation.

I want to see a good effort that comes out of whatever it is. That is the main thing, and we will all be happy.

DR. REYNOLDS: Thank you.

MS. BISHOP: I would like to know, sir, are you still going to plan to give us a list? I agree, not necessarily names, but I agree with your premise that it takes more than money.

Someone else said that, too. It takes a commitment, mentally and across-the-board, and it takes a partnering to do what you are talking about.

I also believe in not reinventing the wheel, also. But I think because you are able to rattle off the alphabets, as I call them, at least having a list of what is where--and we are talking about partnerships, is that correct?

MR. THOMAS: Well, we're, what many of us are doing--there are some basic things we are all doing. I am just surprised that when Dr. Nebular [PHONETIC] testified in Chicago from NACME, he has that list of all the programs that are going on.

DR. REYNOLDS: Yeah, we have...

DR. THOMAS: That list is readily available. If I were to give you the list, there would be something missing because I would do it off the top of my head.

DR. REYNOLDS: We have the list.

MS. BISHOP: I understand, we have it.

DR. REYNOLDS: Thank you, Mr. Thomas. That has indeed been helpful and most stirring. We appreciate it.

Our next person, and last person before we are going to take a lunch break is Dr... [question from audience about microphone] I think so--I will try to talk into it more directly.

Our next person is Dr. Patricia MacCorquodale, Associate Professor of Sociology for the University of Arizona.

Since you may not have this title for her testimony, it is on, "Improving Participation of Women and Mexican Americans in Science and Math."

DR. MacCORQUODALE: I want to thank you for the opportunity to address the Task Force--can you hear me if I talk here?

DR. REYNOLDS: You are going to have to hold that microphone, the bigger microphone to your right. That should work--oh, dear. Let's see. That's right.

DR. MacCORQUODALE: I want to thank you for the opportunity to address the Task Force and to make some observations on the participation of women and minorities in science and technology.

I am Patricia MacCorquodale. I am Associate Professor of Sociology and Women's Studies at the University of Arizona, and although my research has focused mostly upon Mexican-American students, my remarks will include some information about racial and ethnic groups, and the relative position of women within each group.

Concern over the declining technological advantage of the United States has focused attention upon the fundamental math and science training. Because science, engineering, and mathematics are expected to be areas of rapid growth in the next few decades, the underrepresentation of women and minorities in these areas indicates a significant loss of labor power and creativity.

Women continue to be underrepresented in science and engineering. In general, the higher the degree, the smaller proportion of degrees are awarded to women. [Pause]

OK, these are, this figure represents the sex ratios for degrees in science and engineering, and as you see from the figure, women are particularly underrepresented in engineering and in the physical sciences.

At the bachelors' level women get--men get 8.7 degrees for every degree that women get. At the Ph.D. level, make it 23.5 degrees for every degree that women get.

And similarly in the physical sciences, women get between three and seven degrees--men get between three and seven degrees for every degree that women get.

Because the sex ratio in society is a approximately equal, if women were equally represented, all these figures would be about 9.8, 9.9.

OK, similarly, minorities continue to be underrepresented as students, both in higher education and in science and engineering programs in particular. Only Asian Americans and Pacific Islanders are overrepresented in higher education.

Black, Hispanics, and native Americans receive less than half the bachelors degrees expected, based upon their representation in the population, and even a smaller percentage of master's and Ph.D. degrees.

Because both minority group membership and gender affect education, it is essential that we examine the participation in science and engineering of both race and ethnicity and gender.

And I have some figures that will show what happens to Hispanic women. [Pause]

This figure shows that Hispanics, in general, are underrepresented. They get about twice as many bachelor's degrees, based on their representation in the population. If they were receiving degrees in proportion to their representation.

But you can see that Mexican-American women, in particular, are underrepresented at the bachelor's degree level. In engineering, they are hardly receiving any degrees at all.

Similarly, they are underrepresented in math and physical sciences, and only in psychology and the social sciences are they getting more degrees than one would expect.

And if we look at the Ph.D. degrees, the picture is even worse. These are doctoral degrees. There is two baselines, one for males and one for females. Males are doing fairly well. Hispanic males are doing fairly well in engineering, psychology, and social science, but they are underrepresented in the other areas.

And Mexican-American women are underrepresented in everything except psychology.

If we are to solve the shortage of workers in the science, engineering, and technology, more minorities and more minority women in particular need to be attracted and trained in these specialties.

And I would strongly recommend that any policies or programs to increase the participation in science and technology should be designed with attention to the particular needs of majority women, minority women, and minority men.

A program for women in science, for example, should reflect an awareness of the diversity of experience represented by non-Hispanic whites, black, Hispanic, and native American women.

A program to encourage minority students in engineering, for example, should include activities designed specifically for female minority students.

My own research examines pre-college participation of Mexican-American students in science and mathematics, and I want to address a few things that we can learn from this research.

First of all, at the society level, science and math are stereotyped as male domains. Girls, for example, strongly believe that boys do not like girls who do better than they do in math or science.

Boys think that most men would not want to marry a woman who was interested in becoming a scientist or a mathematician.

Mexican-American girls are disadvantaged, both by these sex-typed attitudes about science and math, and because these attitudes are held more strongly in their ethnic group.

So we need programs that will combat sex-role stereotypes.

Parents are a particularly important influence on the aspirations of minority youth. Parental encouragement to enter a math or science field has been found to be a key factor among entering into these fields by minority students.

My research shows that Mexican-American parents value education in general and math and science in particular, as much or more than their non-Hispanic white counterparts.

But in part because of their own limited educational background, Mexican-American parents are less able to be of specific assistance. That is, they are less likely to be able to provide help with homework, to help their children select courses, to give advice about careers and education.

Let me show you an example of what happens. This is a graph of fathers helping with science homework, and what it shows is that when fathers help Anglo boys with their homework, the boys are much more interested in science.

When fathers help Mexican-American boys or Anglo girls with their homework, the kids are a little bit more interested in science. When fathers help Mexican-American girls with their homework, they are less interested in science than when their fathers don't help at all.

And I think the reason is that the fathers are saying here is that science isn't too important. You don't need to do this homework. It is really not going to be very essential for you.

So Mexican-American girls end up being doubly disadvantaged. First of all, they are less likely to get any help at all, and secondly, when they do get help, it is discouraging because of the messages they get with it.

Similarly, minority parents don't have a lot of information about education and occupations because of their limited, their limited experience. For example, when I ask parents how much math is required for high school graduation, three-quarters of the Mexican-American parents couldn't even guess.

Only a third of the white parents did not opt for an answer.

When asked to recommend occupations for their son and daughter, if they were interested in science, 44 percent of the Mexican-American parents and 20 percent of the parents of white girls couldn't give an answer, compared to only 8 percent of the parents of white boys.

So parents need more information about educational and occupational [INAUDIBLE].

And I think we need outreach parents--outreach programs to reach these parents, because I think they have basically supportive attitudes.

Role models are crucial in developing the interest of women and minorities in science, engineering, and math for several reasons. First, because of their lower socioeconomic status, minority parents may be less familiar than majority parents with educational and employment opportunities in science and technology.

Second, the underrepresentation of women and minorities results in few role models with whom students can identify. Examples of women scientists and engineers are particularly important in demonstrating that nontraditional careers can be successfully combined with marriage and family life.

Such role models are especially important for minority girls who expect to have large families and strongly believe that employment and family roles conflict.

Next I want to turn to some factors within the educational system that I think are also influential in participation in science and math.

First, math is a critical filter, because mathematics preparation is an important prerequisite for higher education in science, engineering, and other technical fields, in particular.

Research indicates that minority students take fewer math and science courses than majority students. [Pause]

This is the number of math classes taken by various groups--by various groups, and let me show you what happens. As you can see, in grade seven these lines are relatively close together.

Pretty much everybody has to take a little bit of math in seventh and eighth grade in junior high schools. But as students begin to be given choice, their ability to choose enters in, and what happens is that girls and minority students stop taking math when they are given the choice, so that lines begin to diverge, and there is less math at that time.

The other thing about this is if you look at the specific courses that they take, Mexican-Americans and girls are less likely to take a second year of algebra. They are less likely to take geometry [BELL] and only Anglo boys are really well prepared.

We need to show that the same thing happens with science. Well, let me just say that the same thing happens with science and let it go at that.

Two other factors that I think are particularly important with respect to minority students is the counseling that they get, and counseling that they get and help that they get from teachers.

In my research, it turns out that over half the students have never talked to a counselor about their plans for future education or their plans for an occupation.

And insofar as they are not getting good information about counseling at home, they are also are not getting any at school.

And similarly, in the interactions with teachers are very important, minority students said that they would like more help from teachers with homework. They would like more personal contact with math and science teachers outside of the classroom and tutorial assistance.

Does the sound of the bell mean I should quit talking?

DR. REYNOLDS: Go ahead and take a couple of minutes and finish up.

DR. MacCORQUODALE: OK, let me make a couple of recommendations for change. I think that we need multidimensional programs that will address problems that are obviously very complex at lots of levels.

First, I think we need media campaigns and programs for parents, teachers, counselors, and employers that will increase the awareness of career opportunities in science and technology for women and minorities.

Parental outreach programs are particularly important and I think that we can really tap into the supportive attitudes that minority parents have by giving them concrete ways that they can be involved in helping with their children's education.

Math and science curricula reform is needed to provide educational materials that highlight the achievements and contributions of women and minorities and provide diverse role models.

And I think we have to start early with these things.

We know that attitudes about sex roles and careers are forged in elementary and middle school, and so efforts to alter the aspirations of minority and female students must be designed to start earlier.

Summer and after school programs are particularly important for girls and boys because boys are more likely to explore their interests outside of the classroom, girls need these opportunities.

Tutoring services at home and homework hotlines would enable minority students to get the help that they lack from parents and teachers.

Because female and minority students have positive attitudes towards education generally and math and science in particular, programs are needed to identify and encourage these able but otherwise discouraged students.

And finally, with the growth of biotechnology as an area of scientific research and employment, girls' greater interested in the biological sciences can be used to motivate them to enter into not only technical fields that they perhaps would not have considered in the past.

And in my testimony, I mentioned some programs at the University of Arizona, where the Women in Science Program in the College of Engineering and the Arizona Math Project are working together to incorporate some of these ideas to have parental outreach programs, to have university people who help in the schools, help teach in the public schools, that provide training for teachers to deal with women and minority students, bring minority students to camps during the summer or special workshops, to introduce them to careers in science and engineering.

I think that these programs are successful. The number of women who come to science career workshops now is about a third minority.

The Arizona Math Project has been very successful in increasing math enrollment by minority students, and the College of Engineering Pre-College Workshop showed that about 80 percent of the students that come to those workshops end up majoring in engineering or a related field.

So I think that these kinds of group activities that provide lots of different people focusing upon a multifaceted approach is what is needed. Thank you.

DR. REYNOLDS: Thank you, Dr. MacCorquodale. Questions. Dr. Clive.

DR. CLIVE: A very dangerous question I am going to ask because of all the high-powered Hispanics who are here [laughter].

?: That's redundant.

DR. CLIVE: This is not at all meant facetiously, though. Please--I hope I will make this train of thought clear.

Did I get you correct, doctor, that you said that sex stereotypes are more strongly stressed among the Hispanic?

DR. MacCORQUODALE: Yes.

DR. CLIVE: OK, all right, so, that being the case, one of the charges of our Task Force is to examine the social factors, the underlying social factors that may retard the progress of women and minorities and so on through science and technology.

And I am also aware, having spoken to Hispanics, that there is a more caring, but also more custodial attitude toward handicapped people in the Hispanic culture than in the Anglo culture.

What I am getting at is that over the past 20 years we have seen a revival, a resurgence of pride in culture, in ethnic identity in this country. And it has assumed a certain political reality as well.

If we push these kinds of programs, the kinds of recommendations that you and other speakers have made over the past three hearings, don't we find ourselves also running into a political problem of people saying, hey, you tell me to change these attitudes, this then means that in some fundamental way, I am no longer Hispanic. You are really attacking my culture.

DR. MacCORQUODALE: Well, I don't think that identity and pride in one's ethnicity and having particular attitudes are necessarily related. I don't believe that challenging or changing some of those attitudes will necessarily mean that people won't have pride in their own ethnicity or understand their own ethnicity.

I think the reality is that Hispanic women, like other women, are going to be working--80 percent of all women are going to be working at some point in their lives, and I would rather see these girls go into science and technology where they can get jobs that will make them more money than do other things.

One of the girls in my study, for example, wanted to go into science or technology. She was a very smart person, and she ended up being a cake decorator. And she thought that that would fit better with her orientation towards a family and being home.

And I think that we could have gotten her a job where she would be working in some sort of a science or engineering field where she would be making more money, better able to help out her family if that's one of her values, and it wouldn't conflict any more, perhaps, than other things that she could have gone into.

DR. CLIVE: Did you see that, though, as a triumph of culture over your, what you had intended for her?

DR. MacCORQUODALE: I don't think it was a triumph of culture because what I found in working with Mexican-Americans is that Mexican-Americans, for example, their orientation towards the family often means that they work really hard to help put each other through schools.

And it not that they are against education or they are against science or they are against technology. They want to succeed just as much as anyone else.

And I think that they will be interested in working as families to be able to do that. So I don't think that these attitudes are necessarily cultural.

DR. REYNOLDS: Mr. Fernandez.

MR. FERNANDEZ: Contrary to non-Hispanic public opinion, I think that they would like to have as many of our Hispanic women become engineers and scientists, and therefore then I could retire [INAUDIBLE]

Question on math as a critical filter, what can we do in the public schools, coupled with university support, to make math a critical focus effort at the elementary schools, for instance.

DR. MacCORQUODALE: I think at the elementary schools we can have math that is oriented towards problem solving, math that is more applied, math that has more examples that come from these particular people's cultures, and it involves women, so that girls and minority students get as interested and motivated to learn from that.

I think [INAUDIBLE] science and making that count, the [INAUDIBLE] program, all have provided examples of how we can do that to engage students at the elementary school level.

I think that from then on we have to give students less choices. You can't let them take all these fringy little courses that end up meeting the requirements that don't--aren't the main life courses that they need for moving on [INAUDIBLE].

So I would cut down the number of courses that students [INAUDIBLE]. In the schools that I was studying, for example, students don't even take math consistently in seventh and eighth grade. They can choose not to take math in seventh and eighth grade. They will maybe take it for part of the year.

And once you stop taking it, then you get into high school, and you might take one course and be done with it. And I think you need to take more math [INAUDIBLE].

DR. REYNOLDS: Mr. Reyes, and then Ms. Winkler.

MR. REYES: Just to reaffirm what my colleague said over there. Being a father of three Hispanic females, one a computer science engineer, one a first grade school teacher, and one a physical therapist, we do have the social problem, that I had to fight my mother's, when my daughter wanted to be a computer scientist.

But we do have to change some of the social thinking and [INAUDIBLE], but the question I had was, what was your data base? You refer to a data base, I would like to know what was that data base? Was is just Arizona? New Mexico? The surrounding area?

DR. MacCORQUODALE: In southern Arizona. I studied 2,442 students over a three-year period, and I interviewed 300 parents and 250 teachers in the schools. And I picked schools where minority students were the majority. In other words, schools that had a lot of Hispanics and had a lot of native Americans, which I did not talk about.

And they were scattered throughout southern Arizona, some rural and some urban schools.

MR. REYES: Well, you hit it on the money because the Puerto Ricans that I know, the Cubans that I know in Florida, and some of the Mexican-Americans that I know across the Northern Hemisphere think that. Thank that.

DR. REYNOLDS: Ms. Winkler.

MS. WINKLER: Mine is just sort of a follow up on his question. Will your research results all be included in the paper that you are giving us, or is there something else we could get, because I think it is a very interesting study.

DR. MacCORQUODALE: Yeah, I have included a summary of the papers that I have written, a list of the papers that I have written, a summary of a couple of [INAUDIBLE].

MS. WINKLER: So we can get copies?

DR. MacCORQUODALE: Yes, you can get copies from [INAUDIBLE].

DR. REYNOLDS: Mr. Hill.

MR. HILL: Could you share with us what you found with American Indians?

DR. MacCORQUODALE: Well, the situation for American Indian females is very much like it is for Hispanics. The biggest problem is earlier than that, which is keeping them in school. A lot of them don't want to drop out of school, and they certainly don't want to [INAUDIBLE].

So the big problem seems to be getting them even through high school, much less the courses they are taking while they are in [INAUDIBLE].

MR. HILL: How about the girls who end up staying in school?

DR. MacCORQUODALE: The girls who end up staying in school?

MR. HILL: The ones who don't drop out, who stay in school, who survive the experience there.

DR. MacCORQUODALE: I haven't had a lot of experience in trying to get them into science and math. A lot of them tend to be interested in being into nursing or going into public school teaching, both of which are fine things to do, too, but not into science, technology, and engineering, in part because the jobs aren't readily available for them where they have come from, in those areas, whereas [INAUDIBLE] for native Americans, and that is that native Americans don't like being competitive. They don't like putting themselves [INAUDIBLE].

So, for example, they won't answer in class when the teachers ask them questions. They don't like to show off [INAUDIBLE]. And so I think that since our system [AUDIBLE] has been built on competitiveness so much, these students don't get teachers' attention, they don't get the encouragement, and they don't get the special nurturing that is needed for them to succeed.

They are sort of deprived students that [INAUDIBLE].

DR. REYNOLDS: Dr. MacCorquodale, I can't resist asking a very solid, impressive sociologist just for an off-the-cuff reaction--I am a scientist--I guess I feel our whole cultural milieu laid upon adolescent girls now is anti-science, more so than for our young males.

This is just personal prejudice I'm talking about. In other words--I call it the "Madonna syndrome." The MTV, the emphasis on this free clothing, the whole movie emphasis--do you think there is something to that?

An enormous anti-science pressure on teenage girls in math and science because of what the cultural overlay they get from the media?

DR. MacCORQUODALE: I think it is in part because of the media, and I think it is in part because of these attitudes, that girls really think that boys won't like them if they excell in those areas.

And so even if they are interested, they stop pursuing those interests as soon as they can. And I think that science and technology doesn't have the--isn't a glamorous field.

It isn't something where they think that they are going to be able to show off, whereas going into business and wearing fancy suits and driving hot cars [INAUDIBLE] is what they want. And that perhaps is more appealing.

The other thing that I think is that people, girls really see that science and technology somehow conflicts with having families. Girls, for example, think that nursing would fit better with having a family than having a regular nine-to-five job in science, which makes no sense to me at all.

And I think that they are not able to think things through. One of the things about adolescence in particular is that they are unable to make the links between what they are now and where they are going to be.

So they can't link education and their careers. They can't link their ideas about family life and what they want to do. And they need to be able, I think, to think that through, and think that, well, maybe if I get an engineering job where you have regular hours, it would be better than being in nursing where you have to work shifts.

And they don't think that far ahead. They don't think through [INAUDIBLE].

DR. REYNOLDS: Thank you. One last question from Dr. Jenkins.

DR. JENKINS: I was wondering if you are, or your university, is taking a look at all at transferring people who [INAUDIBLE] that may be having the success with the minority women in your study?

DR. MacCORQUODALE: I don't think we have had very good success in getting people out of psychology. The psychology program keeps raising its requirements and trying to make it harder and harder, so that there will be--people will be forced to transfer into other areas.

But I think a problem is that they are sort of two different tracks, that the people who go into engineering and science have to start very early in their academic careers.

Most of the people who choose psychology or social sciences maybe don't do so until their junior year, and by then they sort of have to back track if they want to go into those areas.

So that's why we really address our efforts at trying to reach high school students. Since [INAUDIBLE] our research, I also work a lot with middle schools. In other words, we try and start earlier to get them thinking that way, so that when they get into college, they take science and math, and whenever they need to, they have a wide range of choices to make, rather than find themselves a junior and having to pick psychology [INAUDIBLE].

DR. REYNOLDS: Thank you very much, Dr. MacCorquodale. We have some individuals from the floor who wish to speak this morning. There are three of you. We can allow you three minutes each.

I would like to begin with Mr. Jose de Jesus Esteban. Is he still here? Good. Please come forward.

Mr. Esteban is with the National Weather Service.

MR. ESTEBAN: I was asked by my boss to come and talk to you today to let you know that I am a product of some of the programs that are out there to get minorities and handicaps in the sciences and technology field.

I am a computer programmer for the National Weather Service, and I am with the Scientific Service Division, and my job is to gather data for the metereologists so they can better prepare, better forecast, so they can do their job better.

And I was--I came from a school that is no longer--I understand it is no longer there. But it is called TADCOMP, the Training of the Disabled in Computer Programming.

And I think what I would like to say to the committee is that we need more schools like the one I just came from, that are slowly--I don't know, for some reason, I think it is for lack of money, that the school is no longer there, and it is from an extension from the University of Missouri in Columbia.

And I know I was in the 1980 graduating class, and I think they just had their last graduating class in '87, and it is really sad to see a good program like that disappear, and I think it is because of lack of money.

And I would like to say that what you do here should be focused on having schools like TADCOMP, where they get people like myself involved and trained and into the work force. Thank you.

DR. REYNOLDS: Thank you very much, Mr. Esteban. Any questions or--Dr. Adams.

DR. ADAMS: Who operated the school.

MR. ESTEBAN: The University of Missouri took it over as an extension. Prior to that, it was, as I understand it, it was more of an individual effort from one lady who ran the school.

DR. ADAMS: Strictly for handicapped?

MR. ESTEBAN: Strictly handicapped. It was nothing but the handicapped.

DR. ADAMS: When you were there, approximately how many students?

MR. ESTEBAN: I was there in the largest class. I think there was 19 of us, and out of that, we lost six, so about 13 of us graduated.

DR. ADAMS: OK, everybody was being trained in the same discipline?

DR. REYNOLDS: Computer science.

MR. ESTEBAN: Computer science, yes.

DR. REYNOLDS: Thank you, sir. The next individual who wished to testify was Ms. Cheryl Fisher, Ms. Fisher, from Parkview High School, Springfield Public Schools.

MS. FISHER: I will try to be as quick as possible. I teach English as a second language at Parkview High School in Springfield, Missouri. However, I am the sponsor of my school's Black Awareness Club, and one of the things we do try to do is to get more black students thinking about postsecondary training.

Some of the problems we have in Springfield is that a few years ago there were quite a few blacks in EMR classes.

Fortunately, most of those students have been mainstreamed, but we still have problems--for example, two years ago I found out in my high school, about 60 percent of the black students were making below 2 points.

And I didn't understand that, and I think part of it is teacher attitude, and part of it is a prejudice which thinks, exists in that area.

Supposedly, most blacks in that area, about three percent of the population--however, I think blacks in the school system are about five to seven percent of the population.

Other black teachers and myself have been talking to the school board and the superintendent about setting up Saturday tutorials, after school tutorials, summer help for black students.

But so far, nothing has been done. And in the last year, some of us have been meeting with the superintendent, and we did a little black parents' group together, and that has evolved into a Minority Advisory Board.

We hope to do more. The thing is we are so isolated in that area--we're in the Ozarks. We don't really have contact with what is going on in other areas.

For example, Mr. Thomas talked about the programs going on in Buffalo, New York, this place, that place, those are large urban areas. We really need something happening for us in rural or semi-rural areas.

And another thing that really bothers me about the lack of achievement I see of black students in the high school, in the school system I am in, is that I am from the South. I went to school in segregation, I graduated from high school in '64, and I took four years of math, four years of science, et cetera.

I now see black kids who are lucky if they get two years of general math. And the orientation is not there. And we are now trying to work with parents in our community, but I think if there is some sort of national impetus to let parents know science and math are important, you know, we need, as Dr. McTague said, we need an educated work force, even if people have not finished college.

And I would like as much support as possible from this group, other national groups, for our area and other areas like us.

I want to say one more thing. Since I teach English as a second language, I work quite a bit with Asian students. One of the things that I notice with the Asian students I work with is of course they study longer.

They also work together. When I come to my classroom in the morning, all my Vietnamese, Korean, Laotian, Cambodian students are getting together, sharing information. And I have tried to encourage the black students to do that. It has taken some time. They are beginning to.

Another thing with the Asian students in my area, they often have Asian professionals they can go to for outside help. Unfortunately, in our school system--and I don't mean to be that critical--teachers do not seem to be that supportive of having after school and Saturday tutorials.

There are also some math and science teachers [BELL], and I will hurry up, who seem to feel that only certain students should take math. They believe math is not for everybody.

You know, English is for everybody, but not math. OK, well, anyway, the Asian students get help from East Indian professors--let's say, like two East Indian girls I know get help from East Indian professors when they feel that their high school teachers have not adequately explained.

The Vietnamese students can go to the Vietnamese brothers and the Vietnamese nuns in our area, because the Catholic Church helped a lot of the Vietnamese to resettle in our area. They can get help.

We have no black math or science teachers in our area that black students can go to for help.

One more little note is that I have noticed among Asian students, and I guess also because 10 years ago I was studying Chinese at Ohio State University and was working on a Ph.D., which unfortunately I didn't finish, but I notice among people in the Asian community, being successful in science and math is also a part of the macho of the group.

In other words, most of the Asian boys I have been around pride themselves on excelling in science and math. They may neglect English or history, but one who is not doing well in science and math will redouble his effort to do so.

And whereas unfortunately sometimes in black society excelling in math and science has just not been presented as the most important thing to do. Thank you.

I will be glad to answer questions.

DR. REYNOLDS: Thank you very much. Yeah, one quick question.

MS. BISHOP: Yeah, I was wondering if you are not getting the support from the teachers that I think I heard you say, what about the volunteer organizations? What about the sororities and fraternities? Or any of those?

MS. FISHER: Ooh, OK, our problem is we just did that.

MS. BISHOP: Are you that isolated?

MS. FISHER: Yes. We just now, let's say about a year ago got our NAACP together, and we talked to them. But see the thing is you all have to realize, see, OK, I'm from Louisiana, I have lived in Portland, Oregon. I have lived in New York City. I have lived in Columbus, Ohio.

And going to Springfield shocked me. I never would have believed it if I hadn't have moved there. And I am sure there are other areas where you have no viable black organizations, where you have no minority professionals, or very few, maybe like, I don't know, I think we have 2,000 teachers in the whole school system.

Maybe 15 percent of us are--not 15 percent--15 of us are black. And most--an interesting thing, too, most of the black teachers happen to bein special services--EMR, LD, PE, and music. And I am not knocking that, but we don't have any hard-core science and math teachers.

And I don't know--maybe there needs to be more training programs for minority math and science teachers. But, you know, we are trying to work--some of the parents are afraid. In that area, many parents are just trying to get by, and because maybe years ago an educated black could not be successful, many parents feel that getting an education is worthless.

So you have to change the minds of the parents, too. We are trying to, but I think if we had more support, maybe if we would have somebody who could visit our school system, see what is going on, make recommendations.

This would make those of us who feel that we are being militant feel that we had some support.

DR. REYNOLDS: Thank you, Ms. Fisher. You put that very, very well. We appreciate it. Thank you.

The last person who wished to testify is Dr. Charles Rankin, Professor of Education, K State, Kansas State University.

DR. RANKIN: I will take the opportunity. Thank you for having me. How are you doing, Howard?

In listening to the testimony this morning, I was very intrigued by the things that are lacking in it. One of the major problems as a educator and a worker of many, many school districts throughout this country--and I would like to debate this gentleman on urban education, because there are a lot of urban school districts that are doing a very good job.

The problem is that the "isms" have taken over. One of the things that America is going to have to come to grips with in the nineties is that one out of every three students will be a minority student.

Currently, you have 12 percent minority teachers in the public schools. In 1991, you will have five percent.

So we haven't addressed the issue that the country is moving toward a multicultural society. That has not been addressed at the national level.

People tend to think that the minorities are going to go away. But that's not true.

Another thing that is occurring is that the role models--one of the, the big push for school desegregation basically hurt the minority population. Because what it did was it removed the role models that were in place.

It affected the black colleges and universities. It affected the black teachers, administrators, counselors, these individuals who would guide these young people into these careers where there are now large deficits.

And I think one of the things that is going to be necessary for this to have an impact, is number one, is that you get some type of national policy speaking to this as a major problem, similar to the one that occurred in 1957 when the Russians sent up the Sputnik and everybody got concerned and Eisenhower appropriated that as a national agenda.

I think if we could get the White House to do this,then people would start taking it serious.

The second thing that has to occur is that we have to start utilizing individuals who can serve as role models. Those retired teachers, those retired scientists, those retired principals, those individuals who can go in and fill the void that this woman spoke of in Springfield, Missouri.

Because young people identify with people who can identify with them. They have to feel that they have the opportunity, that they can get ahead, that people will accept them, and people will provide the things that are necessary for them to be successful.

Someone mentioned that it is no advantage to getting an education. In some senses, that is true. One of the problems with the society that we are getting into now, we tend to react to things like putting Vaseline on cancer.

That just won't work. The schools mirror the society. If you are having problems with the schools, we are having problems with the society.

And I think people need to recognize that. Currently, we have a 45 percent dropout rate in urban schools.

Currently, we have 50 percent single parents in the public schools.

Currently, we have a 33 percent national dropout rate for the Springfield, Missouris, the Lincoln, Nebraskas, the Yonkers, New York. It is 33 percent of those kids dropping out of school. So something has to change.

What has occurred is that in 1906 when you had a 97 percent dropout rate, the employment industry picked up the people, so you didn't have a dropout problem.

In 1987, you have a 33 percent dropout rate, and the industry is not picking up the individuals, so we do have a dropout problem.

So, I commend you for what you are attempting to do. I wish you lots of success, but you have to deal with the realities that are currently existing [BELL], and I don't think that has occurred. Thank you.

DR. REYNOLDS: Thank you, Dr. Rankin. Any questions? Dr. Jenkins.

DR. JENKINS: I have one. I heard recently that there are people who say, if you raise the level of requirements in math and science for minorities, you are going to increase the dropout rate.

Would you speak to that? I think it is specious, but I would be interested in your reaction.

DR. RANKIN: Well, someone mentioned earlier that math and science or any type of standardizations are used as screening devices. That is kind of true. It is only true if the individuals do not have the proper preparation to be successful in those instruments.

I think our major problem with young people in math and science--minorities, women, the handicapped, et cetera--is that the counseling folks are not counseling these young people into the program.

You know, it is that age-old problem of not-like-me syndrome. You know, if the individual is not like that person, then you don't really take an active interest~~ed~~ in that person.

I mean you are polite, you're amenable, you say I have got to do this. But if that person mirrors you, then you have a tighter and more committed concern about them. And I think that if, what you mentioned can occur. It doesn't have to occur.

I think it currently is occurring, though.

DR. REYNOLDS: I would want to interject there--in California, we have just, we instituted a year ago a four-year, two-year math requirement, and a year from now we will be in with a more solid four-year English, three years of math, two of science.

And we have done it on behalf of minority enrollment in the California State University. And our numbers are very encouraging. The students taking more college preparatory--I just call them solid courses--are primarily minority. There has been no change in white course taking.

And most significantly, the numbers of what we call regular admissions amongst blacks and Hispanics are climbing because of this.

So our experience is just the opposite. It is simply pushing through those advisors you talk about more minority youngsters into solid courses, increasing their success rate at getting into college, something that needed to happen for a long time.

DR. RANKIN: Well, I have been working with the University of California at Berkeley. What you are stating is true, except the kids don't stay.

You have about 10 percent...

DR. REYNOLDS: Well, I differ with you. Our regular admits stay. Our whole goal is to have fully prepared youngsters come to college. When we move youngsters, when we move black youngsters out of the conditional admit into the regular admit pool, they succeed.

DR. RANKIN: Your chancellor called me and said he was having his problems. So, somebody...

DR. REYNOLDS: I'm not with the system. I'm the California State University System.

DR. ADAMS: One observation that I think would be important on the math--we might need, and I don't know how [INAUDIBLE] this is updated or not, but Astom's [PHONETIC] study shows that, for blacks, they take--I mean that's one of the reasons that we show up so bad on SAT scores, because we go in there thinking that we have enough math to pass, but we have been in the wrong courses.

But it isn't that we haven't taken four years of mathematics. We have been taking the wrong type of math. So that--I don't know whether we have an update on that, but in terms of just number of years in the math class, the students have been taking sufficient math, but they have not been taking the quantitative kinds of [INAUDIBLE].

DR. REYNOLDS: Algebra two, the fine math. OK, thank you very much, Dr. Rankin. You elicited some interesting discussion.

We are now just about right on time. The group will take a break. We would like to ask the members of the Task Force to go out through that exit door over there. We will resume the hearings at 1:30 p.m. sharp. Thank you very much.

[LUNCH]

DR. REYNOLDS: Could I ask everyone, because of the length of the, the length of time it requires to get back to the airport, to make sure if you haven't already done so, to sign up for a taxi. There is a taxi sign-up sheet, if you don't already know who you are riding with or have some kind of arrangement, please do sign up for the group taxi arrangements.

Let us move on then. After a very interesting morning of testimony, I know this afternoon will be the same. The first person to come before us this afternoon is Dr. Manuel Berriozabal, Professor of Mathematics, University of Texas, San

Antonio.

Thank you. Would you sit right there, please.

DR. BERRIOZABAL: Good afternoon. I am Manuel Berriozabal, Professor of Mathematics at the University of Texas, San Antonio, and Director of the San Antonio Pre-Freshman Engineering Program, and Coordinator of the Texas Pre-Freshman Engineering Program.

I certainly appreciate this opportunity to address this committee, this Task Force, because I think it is really very important work that you are doing.

And I hope out of the results of your efforts, we are going to see some serious accomplishments in getting more and more programs that, more successful programs started and sustained in the efforts to identify talented women, minorities, and handicapped in the fields of science and technology.

Just let me say a few words about the program that I run in Texas. It is called the Texas Pre-Freshman Engineering Program. It is basically a two-year-old program, but it is a statewide expansion of a 10-year old program, called the San Antonio Pre-Freshman Engineering Program, which I organized back in 1978.

The San Antonio PREP program is an intense, academic enrichment program which requires that students come to a college campus for at least one summer for eight weeks, where they take a course in logic, a course in problem-solving, a course in introductory engineering, computer science, and we have various guest speakers and field trips.

We have high expectations of the students. We expect the students to maintain a 75 average to stay in the program, and if they fail to do so, then they are asked to leave the program.

The--over the years, since the PREP program in San Antonio was started, we have had over 1,700 students who have completed at least one summer of the program. It is a three-summer program for those students who want to go for three summers.

And during those three summers, during those years, we have identified--in a poll that we took last summer, we identified 649 students who would be of college age effective this fall.

And of that number, in our follow up, we received responses from 555, of whom 88 percent said they were either in college or had graduated from college, and 67 percent were majoring in science or engineering.

What is even more interesting, I think, is that 78 percent of our students have been minority and 49 of the students have been women. And in Texas that is a fairly startling figure because somewhere between 40 and 50 percent of minority students in Texas drop out before they graduate from high school.

So I feel like, not only have we captured the minds of some of these kids at a rather early age, but we have--to graduate from high school, but to encourage to go to college and in particular to major in science and engineering.

Now we start at grade six in the program, and the reason being because we feel like the grade six, seven, eight are the crucial years to capture the minds of these kids and to get them into the academic pipeline.

Because of the success of the San Antonio program, we were able to start six other programs in the state in predominantly minority areas, such as Brownsville, Corpus Christi, Denton, Edinburg, Loredo, and Lubbock.

If we had the money, we could start three to eight programs next summer, but we don't have the funds. And this is another hope that I have of this committee to try to encourage the foundations, government sources, who are aware of this problem and have a deep interest in this problem to support those programs with a strong track record, successful track record.

Presently, about 50 percent, over 50 percent of our budget is met through in-kind manpower contributions. For example, during the summer, in our programs, well over half of our faculty consists of Air Force and Navy officers who are science and engineering trained, recent graduates of the academies.

And they are assigned to teach in the program, and they really do a terrific job. And this does not cost us anything, and indeed, I think it is a wise investment of the armed services because, number one, they are helping satisfy, helping to meet a national need, and also it is good PR for them, too.

I am--the only thing I am sad about is that I have never been able to get the Army to donate any services to our program.

I have some recommendations for addressing and solving the problem of minority underrepresentation in science and engineering, and this is based upon the PREP program and what we have done.

And I think this, you have a sheet in the materials that I sent you some weeks ago.

Number one, I would urge to organize intervention programs for elementary school, middle school, and high school students from six to eight weeks in length, for two or three summers, which stress academic enrichment, and which have high expectations from participants.

Two, establish intervention programs on college campuses, so that successful participants realize that they can negotiate studies in a college setting through commitment and hard work.

Three, develop both residential and commuter intervention programs.

Four, encourage linkages between intervention programs conducted by colleges in minority-impacted areas and affluent prestigious colleges.

For example, an affluent college might provide in-kind manpower support to some intervention programs.

Then as a subsequent, in subsequent summers, invite some outstanding minority participants for eight weeks of academic enrichment, completely at the expense of the college.

If a participant does well in the summer program and continues to do well in the local school, the affluent college will agree to give automatic admission to the student upon graduation, and offer this student a complete academic scholarship with all expenses paid.

Right now, we are trying to establish a linkage like this with the University of Notre Dame.

Five, develop linkages between intervention programs and military services, whereby the latter will contribute the services of officers to teach in the program.

For example, a potential pool of no-cost military assistance is the most recently commissioned officers of the military academies and the ROTC units.

Many of these officers are commissioned in May and do not report to a long-term assigment until August or September. Rather than giving them orders for temporary assignments at some military base, the skills of these individuals can be used most effectively in summer intervention programs.

These officers serve as strong role models for the program's students and it is a very inexpensive contribution of the military services to the development of our human resources.

Develop linkages between local Job-Training Partnership Act sponsors and intervention programs, so that poverty level students can participate in summer intervention programs and have this experience serve as work experience in JTPA.

For example, in the PREP program, many of our poverty level students can earn up to $800 by studying in the PREP program by being enrolled in a Job-Training Partnership Act sponsors in the city of San Antonio.

And these sponsors recognize the PREP program experience as work experience.

Develop linkages between intervention programs and local science and engineering professions, whereby the latter will sponsor limited activities with the program participants during the academic year.

Encourage local school districts to contribute services of premiere teachers to summer intervention programs, and to give independent studies credit to successful program participants.

Establish linkages between intervention and participant parents. For example, at the beginning of a recruiting cycle, hold orientation programs for parents of prospective applicants.

After recruitment is completed, hold another orientation for parents of selected participants, and at the end of the program, hold a closing day assembly to which participant families and friends are invited.

Give incentives to public and private industry and agencies to responsibly and consistently support good intervention programs, as opposed to giving PR donations to doubtfully beneficial programs.

Recruit strong accountability and reporting components--require strong accountability and reporting components which will emphasize the tracking the participants through high school and college.

The only meaningful payoff for a high quality intervention program is measured by the number of students who graduate from high school and the number who go to college, the number who major in sciene and engineering, and the number who graduate from college.

Offer transportation and lunch support to intervention program participants who qualify for school district free lunch or reduced cost lunch but do not qualify for a JTPA program.

And lastly, for successful intervention programs, offer long-term support [BELL] so that the director does not constantly have to spend most of his or her time in money-raising activities.

DR. REYNOLDS: Thank you, Dr. Berriozabal. Questions? Yes, Mr. Fernandez.

MR. FERNANDEZ: A question on the linkages between the universities and the public schools. Have you had any luck in getting the universities to put some seed money or [INAUDIBLE] money in the intervention programs for this [INAUDIBLE]?

DR. BERRIOZABAL: Well, of course, manpower, if the university contributes manpower, that is in itself equivalent to seed money because this means that the individual is being paid or getting part of his or her salary from the university.

Usually, in our programs, once we get some seed money to a program started, we do get in-kind contributions from the university. This has happened in the Tex PREP program.

DR. REYNOLDS: Dr. Adams.

DR. ADAMS: Doctor, we talked a lot this morning about teacher attitudes and professors' attitudes, mathematical phobia and stuff like that. You are a professor of mathematics.

Tell us, if you would, what we might do as we think about this? We have got to come up with some kind of recommendations.

How might we package this so you and your colleagues who teach mathematics might have a better understanding of what we are trying to do? Now you understand what we are trying to do, we are trying to come up with some recommendations.

How might we--what do we need to do? If you were trying to approach your group, if you were trying to approach mathematicians, what would you do?

DR. BERRIOZABAL: Well, it's strange that you should ask this question because I happen to be on a task force in the Mathematics Association of America to study this particular problem.

And we hope to come out with a report sometime in 1988. So I think that partially answers your question. Our profession is seriously interested in this problem, and hopefully we will come out with recommendations for you, if you don't mind.

DR. REYNOLDS: Dr. Clive.

DR. CLIVE: In The Atlantic recently, there was an article, and I don't know whether you saw it, on the great mathematician Paul British, and in that article some attention was paid to the rivalry and competitiveness among mathematicians, and an unnamed Texas mathematician--who I assume is not you--was quoted as follows:

"I would rather that a theorem be unthought than that I not be the one to think it."

And this sort of struck me as typical of the kind of competitiveness in science that seems to discourage a lot of women. I just wonder, what is your observation of women in mathematics.

DR. BERRIOZABAL: Well, right now, in mathematics and in engineering, from what I can see at my university, we don't have that many women pursuing these fields. In the PREP program, for example, though, this past summer, I have seen evidence to the contrary.

Every year we give prizes to the--the most outstanding participants in the program get 10 prizes every year, and this year, this year we gave 12 prizes, and nine of the prize winners were women.

I think it is getting--whether they are minority students or women--it is getting them, getting to these individuals at an early age, and letting them realize that there are opportunities for them in science and engineering.

And I think this is where you have to start. What happens is if you don't catch these people at an early enough age, then they are going to go through high school, they are going to take the easy math courses, the easy science courses.

When they come to college and decide, well, maybe I would like to go into science or engineering, they are not prepared to do so, and as a consequence, they drop out, they bomb out.

They are screened out. So I believe that if we get to these individuals at an early age, and I think the earlier the better, but certainly no later than middle school years, you would probably find we are going to have a significant number of women and minorities in science and engineering, and prepared to take, to pursue studies in science and engineering at the college level.

I am not sure whether I have answered your question, but that is how I would answer.

DR. REYNOLDS: Excuse me, Dr. Clive, do you want to finish up. Please finish up, Dr. Clive.

DR. CLIVE: Just to follow up--the question was really aimed at competitives. Have you noticed that women--is mathematics as competitive as pictured? Do women find it difficult to function in that milieu?

DR. BERRIOZABAL: I think those who are in it and who have survived have competed. Otherwise they would not be where they are. Yes, it is competitive. I am not quite sure what--it is not competitive in the sense that you working directly against someone else. You are probably working against yourself.

DR. REYNOLDS: Dr. Clutter.

DR. CLUTTER: Dr. Berriozabal, in the National Science Foundation in the last couple of years, there have been a number of, quite a number of discussions about the teaching of mathematics.

And in fact, it has been suggested by some people that part of the reason women and minorities don't fare well when they reach higher levels of math--it is not because they don't have the ability--you yourself are seeing that women and minorities certainly have the ability in your program at pre-college levels--but there is something wrong with the way math is taught once people reach the college situation.

And in fact, at the present time, we are sponsoring a study on curriculum development in calculus. You probably know about that. Do you think that it has to do with the curriculum or is it something else?

DR. BERRIOZABAL: The answer is no. I don't think it has anything to do with the curriculum. I believe if a student is encouraged to take the pre-college level courses in high, take it up through trigonometry and calculus, to take physics and chemistry, and they are interested in majoring in science and engineering when they go to college, the individuals are going to be in a strong position to compete and to be successful in these areas.

I think it is just a lot of nonsense when people say you have to teach minorities and women special courses. I look at myself. There were no special courses for me when I when to Rockhurst College, which is not too far from here, and I graduated near the top of my class.

And I think this--and I am not saying that every minority can do this, but I think it is an insult to say that you need to have special programs for minorities in order to--it is an insult to minorities and women to say they need special programs in order for them to get through.

I think what they need is good, solid foundation at the pre-college level, and that is all there is to it.

DR. CLUTTER: I didn't mean to suggest that there would be any special programs for women and minorities. It is just that some people are saying a lot of people are having trouble with mathematics because of the way it is taught.

DR. BERRIOZABAL: Oh, no, I disagree.

DR. CLUTTER: Do you think we are wasting our money exploring the curriculum redevelopment in calculus?

DR. BERRIOZABAL: Well, oh, I would, I wouldn't rule that out. I don't--there seems to be an effort in this country to try to sugar coat education, and if you are going to succeed in education like anything else, you have got to work hard, and that is all there is to it.

And you are not going to get a different answer out of me on this. And it really bothers me when I see--when I am asked by NSF to come up and read some of their proposals, and see some of the trash I have to go through, where they are trying to--so many proposals trying to validate some theories of Piaget or something like this, when so many of these things have been funded and our educational system has gotten worse and worse and worse in this country.

I think if you all--I should hope you would all make serious recommendations that we should encourage our students to think that it is something noble to think--it's something--it may be hard work, but it is enjoyable. It is enjoyable hard work.

I think that's how most of us have made it here, and some of these educationists who have got their feet firmly planted in mid-air have really fouled up our educational system in this country.

I'm sorry if I got off on a tangent, but I don't want to leave you with the impression that I am not compassionate. I feel like I am a very compassionate person. In fact, I wouldn't be--I doubt if I weren't compassionate I wouldn't have started this kind of program.

I am very proud of the success that we have had with our students in this program, and I think if we had more programs like this, more positive oriented programs to get minorities prepared for college, and women prepared for studies in science and engineering, we could easily change the direction of education in this country.

But you are going to have a lot of people fighting this type of--these programs. In fact, I have encountered a lot of--this program in Texas encountered a lot of opposition. My Chancellor has told me that he has talked with people at very high levels who would like to kill this program in Texas.

But it is a very successful program, and there are other people who don't want it to be killed.

But what people like myself, and I am sure there are others throughout the country, we need a great deal of support, financial and moral support from groups like this.

MS. BISHOP: I just have one question. I was curious--for me, I am not out in Texas. Why do people want to kill that type of program?

DR. BERRIOZABAL: Because there are people in power in Texas in our educational establishment and our political establishment who are still trying to preserve the status quo.

And if you want to keep women and minorities down, the easiest thing to do is to make sure they do not get a good educational background. That's very--at least in my simplistic way.

MS. BISHOP: I didn't want to presume I knew the answer. That's why I asked.

DR. BERRIOZABAL: Oh, OK, well, I hope my...

DR. BISHOP: Thank you.

MR. OAXACA: I have a question.

DR. REYNOLDS: Yes, Mr. Oaxaca.

MR. OAXACA: Manuel, San Antonio has a high Hispanic population, and when you look at the national numbers on how many Hispanics get out of college with an engineering, it is under two percent of right around there.

Are you because of these programs in a city like San Antonio, are you transcending that and maybe putting out twice as many as the rest of the country is, or something like that? Are you getting 12 percent out of an eight percent population average, or whatever it is in San Antonio?

How are you doing?

DR. BERRIOZABAL: Well, I have never--first of all, I haven't had the time and the manpower to take a study like this.

MR. OAXACA: It's simple math.

DR. BERRIOZABAL: Well, I have not been able to count up the number of graduates in engineering from the San Antonio area, but I have been told by superintendents that a significant number of the students who go on to engineering go through the PREP program.

But that's--it's purely qualitative, it is not quantitative.

DR. REYNOLDS: Thank you, Dr. Berriozabal. Very impressive, and we admire your commitment. Thank you.

Our next person to testify is Dr. Gene Hampton from Science Pioneers, Inc. of the Midwest Research Institute.

DR. HAMPTON: Good afternoon, it is a distinct pleasure to be here today. This is the first time I have ever done something like this, and I am going to get an education into this afternoon.

I am Executive Director of Science Pioneers, Inc. Through its many programs, Science Pioneers works to direct students for the better understanding of science and technology, especially as they apply to the high-tech world that we live in today.

The organization is sponsored and supported by corporations, businesses, school districts, and foundations in and around Kansas City.

It has a vested interest in promoting students in science, technology, and engineering. We cater to a six-county metropolitan Kansas City area.

Realizing that students learn in a variety of ways and have a variety of interests, we try to offer a multifaceted science-oriented program. Most notably of these programs is the Greater Kansas City Science and Engineering Fair, which is the second largest in the country at the present time, and is presented each year in April in downtown Kansas City.

Science Pioneers provides Saturday science seminars for students which feature area science researchers and technologists, and I have to admit that I feel right at home speaking here today because this is where we have our seminars every other Saturday throughout the year.

We average about, this year so far, about 80 to 90 students per Saturday. We have one coming up this Saturday, as a matter of fact.

In addition, Science Pioneers is responsible for bringing prominent scientists from around the world and throughout the country to Kansas City so that they can share their research interest with the community.

In addition, in an effort to involve still a greater number of students, science pioneers has recently taken on two different programs: "Invent America," which features student inventions, and we, well, we work with the Invent America program in Washington, D.C., and this is kind of how we got started and what prompted our interest in this field.

We also sponsor the Science Olympiad for the region of metropolitan Kansas City, which in turn is part of the national program.

In essence, Science Pioneers endeavors to expose young people to the wonders and excitement of science and technology, while enhancing their understanding and interest in these two important fields of study.

For the young people of today represent the scientists and the engineers and the technologists of tomorrow. We are firmly dedicated to this.

One thing that I didn't mention is that in addition to being Executive Director of this organization, Science Pioneers, I am a classroom teacher. I teach biology in one of the regional high schools, and I also serve as the department chairman.

What I see happening in terms of the way the country is going, the way education is going, has me greatly concerned. And I have to admit that I am truly delighted to see a group like this here today, trying to do something about this.

In talking with Dr. Adams before we started here today, he gave me some food for thought, and I appreciate that, having to do with the people who are applying for jobs in science and technology and also going into graduate school and so on.

We were getting more and more foreigners, foreign nationals, if you will, and we need to do something about that.

Recently, in Washington, D.C., I heard a seminar having to do with the inventions that are going on in this country. Well, I heard two different statistics. The one in

Washington was that 36 percent of the patents that were applied for and issued in 1986 went to foreigners or foreign nationals.

Recently, I talked to a patent attorney here in Kansas City, and the figure there was, they estimate 50 percent of the patents applied for in this country this year will be applied for by foreigners or foreign nationals.

How accurate those figures are, I can't document that, but I think it is safe to say that it is certainly reason for concern.

This is why Invent America was established in the first place, as an outgrowth of concern with the U.S. patent office and also the Department of Commerce, hoping to turn on the invention process in our young people in this country.

I think the idea being, too, that inventions, if they are invented here, will more than likely be marketed here, and we all know what our state of economics is at this time, in terms of the trade deficits and problems of that sort.

What can be done to turn this problem around? One organization that I am very much interested in right now, and perhaps many of you on the panel are familiar with the Triangle Coalition, which is coming out of the--well, it is actually sponsored by the National Science Teachers Association, and is also--I know the National Science Foundation is involved also.

The idea being here that local alliances, state alliances, partnerships in education were by the local businesses, industry, research institutes, medical centers, and so on begin to play a more active role in our community schools.

I think, looking back over my last 30 years of teaching, I have seen a greater and greater trend toward education trying to do its own thing, private sector doing its own thing, and neither one knows what the other one is doing.

And yet the public schools and the private schools, pre-college education, we are responsible for producing the employees and people who are going to fill those positions in the future.

We both need to sit down and talk eyball-to-eyeball as to what the other one is doing. And I am thrilled to death to see that in cities like Atlanta and Pittsburgh and hopefully here in Kansas City in the next few years, that we are going to get more and more involvement from the private sector.

Manuel mentioned hard work. I was talking to the Associate Superintendent of Schools in our district just this morning, and I couldn't help but feel that one of the reasons that we are in the problems that we have right now, where we are not producing the scientists and technologists that the country needs, not only now but we will need certainly in the future.

We are certainly not getting qualified people to go into education in science and technology. I see fewer and fewer student teachers, and then there are student teachers that I do occasionally see that, I would say they are not quite the quality that I remember seeing a few years ago.

I think that we are in a situation where the connotation or the understanding of what hard work is is not longer part of our society. I don't know if we are resting on our laurels or if it is the family upbringing of the youngsters of today or just what it is.

I seem to be arguing more and more with people about the rigors of the program that I tried to present. They said, well, slack off a little bit, don't make it quite so hard. Let's teach more to the middle of the spectrum.

And I say, that's the wrong thing to do. It will not be the--let's say, average population in our country that will be the scientists and the engineers, the leaders in these fields in the future.

We have got to take those that are qualified, that are not afraid of hard work, and to promote those people, and encourage them in any way we can.

Now, I realize that we are here today addressing women, minorities, and the handicapped. I fail to recognize those as problems. What I see as a problem, or what I recognize as a problem is a failure to know what hard work is.

And I have worked with women and handicapped and minority groups, that if they know what hard work is, the job gets done.

And so I say therein lies where the problem really is.

I am sorry I don't have more statistics to offer for you today. I think I was contacted maybe less than two weeks ago that I would be here today, and I don't keep the type of statistics that are presented today in the folders that you find there at your table.

But I thought it was kind of curious--I got kind of curious and I wondered, well, gosh, we have had this science fair again in the city, where we have over 1,500 students who enter each year, and I was just wondering, well, what would be the ratio of males to females?

And so I put together the information that you see there, and I really was surprised, I really thought there would be more males entered in the science fair than females, but I notice that it is 49 to 51 percent, almost 50-50.

Then when I look at the number of awardees in the science fair, I find out that the boys seem to outshine the girls when it comes to quality of research projects.

Now, these are experimental research projects only. We do not include the--what we call the non-experimental projects.

In the seminar program that we offer here, so far this year, that was the only statistics that I was able to come up with, out of the 200 students who have attended so far, you can see that the statistics there are about 55 to 45 percent.

Well, I think that I heard the bell, so I will close at this point.

DR. REYNOLDS: Thank you, Dr. Hampton. Dr. Jenkins.

DR. JENKINS: I'm curious--are there any minorities at all in the Science Pioneers. Do you have a guess what percentage there would be, and what minority [INAUDIBLE]?

DR. HAMPTON: Well, first of all, perhaps I should explain the structure of Science Pioneers. It is not an organization to which one can belong. It is controlled by a board of trustees, myself, and my secretary.

As far as the board of trustees are concerned, we have two blacks out of 16. Beyond that, well, women, I would have to say that we are needing more women. We have one and now she has since moved to Chicago.

Now, as far as people involved in the science fair, I would say that it is about predominantly white. Of course, the Asians are--well, they shine, I would say, in the science fair.

As far as boys to girls, though, you already have that statistic.

DR. REYNOLDS: Thank you. Are there questions for Dr. Hampton? There is an interesting thing one can extrapolate from your statistics. There is a gradual loss of female interest. In other words, on either page that you gave us, the numbers of girls involved in grades eight on down, it is roughly 50 percent, but by the time you get into grades nine through 12, on the experimental projects, your girls are at 39 percent and males are at 61 percent.

Similarly, on your other sheet of data, the--there is an interesting transition from, if I am reading these correctly, from the intermediate grades where girls are more, have interest in the physical sciences and engineering.

By the time they reach senior high school, the majority of the girls are showing the biological sciences interest, while the flip is true for boys, who show more physical science interest.

So I think your data are perhaps more revealing than you might think of some of the problems that we are dealing with.

DR. HAMPTON: Oh, I agree with you, and it would be very interesting to pursue that a little bit farther and find out some of the reasons for that.

Another thing in our own school system, I know in our science program, we are finding more and more girls going into physics, which a few years ago, that was just almost unheard of, and we have about a 50-50 ratio of girls-boys in chemistry, which I think is tremendous.

You might be interested, too, in another statistic which I don't believe I--you know, I don't have printed there, but I am also an officer with a national organization, the Association of Presidential Awardees in Science Teaching, and when I learned that I was going to be here today, I was just curious and went through the membership that we have, and out of the 80 members that we have at the present time--it just started last March--I noticed that the number of chemistry teachers who have received that award--it is about 75 percent to 25 percent in favor of women, which that really did surprise me. I think it is tremendous.

Physics, however, we find about 60 percent to 40 percent, males to females. Biology is about half and half.

DR. REYNOLDS: Quick question.

MS. BISHOP: Yes, just a quick. What do you think is the observation, or what is your observation for the success for the Asian students. You mentioned that they are pretty much successful, and you just made that qualitatively, but do you know why they are so successful?

DR. HAMPTON: I'm convinced it is the work ethic in the home.

MS. BISHOP: Pardon?

DR. HAMPTON: The work ethic in that home, and that they are hard workers. I have a student, for example--let's just use this as an example--he is a senior in high school. He is taking [INAUDIBLE] biology right now with me, which is normally a ninth or tenth grade class, and how he got to a senior and not get biology, I'm not sure how that happened.

He is also taking chemistry II and calculus. He has to do a research, an independent research project for the chemistry II class. He also has to do an independent research project for me.

I was concerned about his well-being, and so I called him aside the other day, and I said, Chong, I said, I am really concerned about this. You have two projects going on. And I said they are both going to be backbreakers. I know how much work there is involved. Is there any way we could make this a research project in biochemistry where we could tie the two disciplines together?

And he said, well, that's all right, he says, don't worry about that, because, he says, football is ending next week, and he says, I'll have more time then.

And I just had to raise my eyebrows at that. I don't find that very often.

DR. REYNOLDS: Thank you, Dr. Hampton.

DR. HAMPTON: You're welcome.

DR. REYNOLDS: We now move to Dr. Walter Smith, Chairperson, Department of Curriculum and Instruction, School of Education, the University of Kansas.

[Pause]

DR. SMITH: Well, I appreciate very much the opportunity to be here to speak with the audience, but I am going to turn my back on you, I'm afraid. I understand that the Task Force up front is who I really want to talk to.

I believe that my primary concern is under your charge to identify exemplary programs, but the kind of program that we have developed, that has the acronym COMETS, is different than the other kind of programs you have been talking about.

The other kind of programs, MACESA and so on and so forth, are programs that are located at a particular location. The COMETS program, on the other hand, is a set of curriculum materials to be used by teachers and people in the community.

So, either in the classrooms or in the community organizations like MACESA, these materials can be used.

So I would like to make that distinction first of all.

The COMETS materials were developed with National Science Foundation funding and now have been disseminated with funding from the TRW Foundation, through the National Science Teachers Association.

What we have tried to do is wed together federal and private funds. The materials are developed for use in grades five through nine to teach science, but not as the science program, but rather a supplement to the science program that is being used in the school.

What we are concerned about is that we show students that all people use science. And I want to emphasize that "all" is underlined. It is not just the physicist, but also the plumber. Not the researcher but also the rancher who needs science.

What we want to do is to increase the scientific literacy of all people. That will impact both in the sense that all people need science to get along in our technological society, but also that as we increase the pool, there will be more people from whom to draw the scientists that we will need for the 21st century.

Well, I am going to teach science, but in the context of teaching science we have to deal with the mindsets, the kind of ideas that students have about science and about scientists.

You have had quite a little bit of testimony along that line, but let me try to bring that home.

I am going to do something different. I am going to give you all a test. What I am going to do is show up here on the screen a picture of a scientist. The scientist is kind of looking off to that direction over there toward the flag. I am going to show that to you for about half a second.

What I would like you to do is mentally figure out whatevery you can about the scientists--physical characteristics, how nice a person it is, how smart, anything you can figure out about the scientist.

So if you will give your attention up here, on the count of three, I will give it to you. One, two, three. OK, now you turn to your partner there, and tell your partner about what you have just observed, anything you have figured out about the scientists there.

[Garbled conversations]

In other circumstances, I would give you quite a lot of time to go through this, but I am curious, how many of you saw the mouse?1 The head up here, the ears, and so on and so forth.

What I want to emphasize is that reality is created in our heads. We create reality out of the observations we make, but also out of our expectations, and I told you were going to see a scientist, so more people tend to see a person there than tend to see the mouse.

That is what I am talking about with mindsets. Students come to school with certain mindsets, like they have some ideas about who does science. And as they look around their classrooms, they can kind of figure out who there is going to do well in science, whether you call that person "the brain" or "the nerd."

Nevertheless, that is the limited number of individuals who are going to groove on this stuff that we call science.

In fact, that mindset is so well ingrained that even Gary Larson uses it. [Pause]

Another mindset that is particularly of concern to us, and that is that women who go into science have several problems. One is that they will be unfeminine--what's a nice girl like you doing in a place like this?

That there is a conflict between the roles of parent and spouse, and then there is even some thought that maybe girls don't have what it takes in the way of mathematics.

There is another mindset among students, and that is that only a limited number of people need science. If you have that idea, that science is done by that wierd band in a white lab coat with smelly chemicals, then you translate that into, these people go into this direction, which is about three percent of our careers need science.

You're going in other directions, and that's where they [INAUDIBLE] that we're dealing with. They think no one can be football players or actresses.

That brings me now to the COMETS material. What we are trying to do is to teach science in the context of that, change mindsets that the students bring with them. And what we are, how we are doing that is by bringing the role models--the kind of people that you all have been hearing about this morning--into the classroom.

Again, what is different about our program is that we provide the materials for the teachers to in turn give to the role models so that they can come into the classroom.

Live people from Kansas City or Springfield or wherever to come into the classroom to do science with the students, not science just to blow off some time, but science that reinforces what the kids are learning about.

So that as the person does the science activity, they then can comment on, here is how I am using that idea in my job. So the students get an answer to that question, why should I learn this stuff anyway?

Well, not that careers is everything, but if people in the community use the very things that these kids are learning about in their work, that's a powerful argument to the students that maybe this is something that is useful.

When the person comes into the classroom, they do three things for the students. They first do this mind-capturing activity. Then they relate that to their work, and then finally, they talk to the students about their career.

To illustrate that on the paper that I was passing around here, there should be a paper clip. Each of you would get a paper clip there. Actually, you can work in pairs, and for this, I am going to have to put down the microphone.

For those of you who have a paper clip, if you would take that paper clip and bend it out straight. What I am going to play is the role of the role model coming into the classroom, and if you get the paper clip about that straight, that's good enough for our purposes.

Actually, you just have to work in pairs here, so if you have, each of you have one, maybe turn to your partner there.

If one of you will hold the paper clip with two fingers like so, and the other person grab on with two fingers like so--first person, your whole job is just to hold it there good and tight. Second person, you're going to roll it--rotate the wire without turning your wrist, without doing this sort of thing. It's just fingers against fingers.

Now, since the bell is about to ring, I'm sure--let me just rush on and say, if you will take the paper clip now and put a couple right angle bends in it there, and the Task Force will recognize that if it gets to be about that, that it's good enough for government work, and we can go on.

First person--this is mainstream class, you don't have to do anything different than you did before, all you have to do is hold on with two fingers.

The second person, though, grab on like you did the first time, but this time it's OK to go ahead and crank around.

If you all were a real live class, I would go on and we would have a discussion about simple machines, mechanical advantage, whatever it is. What I am imagining is that I could be an engineer, but I also could be somebody from the--the mechanics from the local garage.

I am not here to say that everybody has to have a Ph.D. in science in order for the United States to be safe, or something like that. Nevertheless, the more science that our whole citizenry know, the better able they will be to perform their various jobs.

So with the COMETS material, what we have are about 100 different activities like that keyed to different careers and different science topics.

In addition--that is the first kind of role model, bringing people in from the community. The second kind of role model that we have are historical role models. I won't test you like I usually do, but I might ask what women do you know of who have won the Nobel Prize or had similar kinds of contributions in science.

And I will tell you that I have done a workshop along these lines in about 30 states now, and so far Marie Curie is always mentioned, and there's one or two other ones mentioned, but we don't know too much about the contributions women have made.

So in the COMETS material is information about the three dozen women who have won the Nobel Prize, et cetera, again keyed to the science curriculum.

So it is not something you have a women's week or whatever, [BELL] [INAUDIBLE] throughout you are giving students information about contributions women have made.

The third kind of role models, since it is hard for students when they are 13 years old to identify with Barbara McClintock--there's stories about the approximately 24 women who have, from basketball coach to whatever, and the students read about a basketball coach and how she uses science--not, just kind of wove it in.

We are constantly trying to get the message across that all people need science.

You are going to be interested in cost, the cost of the material is $24.00 per set of materials. Then beyond that, it is all the labor of the teacher and the labor of the resource people.

So there certainly is a lot of cost there. It's just that the upfront cost is $24.00.

As far as effectiveness, we have done an experimental study that included classrooms in Albuquerque, Oklahoma City, Kansas City, Cincinnati, and Cleveland, Ohio, and there is a significant change in a positive direction about the students' attitude toward women and science, and toward science.

A lot more I can tell you about COMETS, but I'll cut off my formal part right now.

DR. REYNOLDS: Thank you very much, Dr. Smith. Mr. Hill.

MR. HILL: Walter, have you seen, what have you seen in your trends of minority people going into science education research that teach [INAUDIBLE]?

DR. SMITH: I can say things about statistics, but I am sitting in the same room [INAUDIBLE], ask her those things, but my impression is that the percentage is probably going down. Certainly the percentage of minority teachers overall is going down, and I'm fairly sure that that's the case in math and science also.

MR. HILL: They don't see many faces in the classroom.

DR. SMITH: No.

DR. JENKINS: How about the reflection of minorities in the COMETS material? Do they see models in material that is used that would encourage minorities to consider science?

DR. SMITH: OK, there are two volumes. One are all these various activities that I have talked about, and those are race blind, and this is the material that the teachers see.

Now, I can't hold the teacher by the scruff of the neck and force them to bring minorities, women as resource people into the classroom. That's entirely up to them, but the materials themselves are race blind.

DR. JENKINS: When you say they are race blind, do you mean in pictures like we saw, there is going to be no indication that they might have been minorities?

DR. SMITH: No, there will be minority, majority, both in those sort of things.

Now--but I also have to tell you that I used to be Associate Dean of Women, and I was very interested in encouraging women in science, and at the time we started the COMETS project, I thought I would be a charlatan if I was trying to pass myself as somebody who could do something about the minority problem.

So, in the profiles there are some minorities, in the stories that the students read, but not nearly enough. And like everybody else, we are by the bootstraps trying to revise those materials.

In the next edition, there will be actually a majority of women, folks in profiles.

DR. REYNOLDS: Mr. Fernandez

MR. FERNANDEZ: One of the big problems that we have in the university system, the departments of education are sort of sitting in isolation and not working with the math departments, the engineering and science.

We need to develop these in-depth programs for teachers. Have you done anything within your program to maybe cross-feed from the other departments and also maybe be able to [INAUDIBLE] with the public schools?

DR. SMITH: Remember our program per se is just a set of materials. Once the materials are out in the hands of the teachers, then we are into a dissemination phase and we are beyond the COMETS program per se.

As far as the development was concerned, a physicist, a geologist, and I have a biology background, so we did try.

MR. FERNANDEZ: Do you find that that's a realistic picture of what's happening in the [INAUDIBLE] the departments of education really don't have any forum or ties to the other departments.

DR. SMITH: Now we are talking about something different than COMETS, but yes, that is a very large problem that the schools of education or departments of education are separate from their academic departments [INAUDIBLE] a large university like the one I happen to be in.

DR. DANEK: Are there any steps being taken by the education colleges in order that science departments [INAUDIBLE] the role of interacting with school districts at the pre-college level for mathematics professors, [INAUDIBLE] professors, or different science departments?

DR. SMITH: Well, again, that is outside of the comments and materials here. Any programs to bring the university and schools together...

DR. DANEK: Well, more than that, the science faculty [INAUDIBLE].

DR. SMITH: Well, there's all sorts of things, there's like Junior Academy of Science, there are summer science programs, there are all sorts of speeding. Is that enough? No, no, it's not enough. I think they are facing up to that.

MS. BISHOP: I have one question about the content of the COMETS. Are you using examples of real life people in current days, or are you going back into history, or a combination of both?

DR. SMITH: A combination of both. Remember we have three kinds of role models. The first is the contemporary--we found out with contemporary that the real live role model comes in from the community.

MS. BISHOP: I meant the ones that the students read about.

DR. SMITH: The ones that they read about? The ones that they read about are all current.

MS. BISHOP: All current ones.

DR. SMITH: Yes, um hum.

MS. BISHOP: I was just thinking you might want to throw in some historical purposes.

DR. SMITH: We do. We have three kinds of role models. There is the historical information. That is information that the teacher has, that they weave into their lectures, so that they can talk about [INAUDIBLE].

MS. BISHOP: What comes to mind are patents from black inventors, which there is a whole series about, and there is a lot of things that blacks have invented that no one knows about.

DR. SMITH? Right, we are very indebted to the [INAUDIBLE] Guiding Corporation. Are you familiar with their set of posters?

MS. BISHOP: No, I am only familiar with the Patent Office--they got it from the Patent Office.

DR. SMITH: OK, [INAUDIBLE] put out a series of, I guess over 15 posters in the series of black scientists. One of your colleagues is on one of them, [INAUDIBLE].

MS. BISHOP: Gail--Jill Clark Cobb, Jill Cobb, at Fullerton.

DR. SMITH: At Fullerton, I knew there was a connection out there someplace.

MS. BISHOP: Thank you. Dr. Smith also makes an important point, which by association with the NSTA, there are several science organizations who have been laboring in this valley over the last 20 years.

And you remind us that you and your colleagues have been working very, very hard on some of the issues in front of this commission, and we need to take that into account as we move along, as we make our recommendations.

MS. KEMNITZER: Hopefully, Mary Beth Rowe, who is the

President of NSTA, will be with us in Atlanta to talk with us.

DR. REYNOLDS: And there are, of course, more. The NABT, National Association of Biology Teachers--help me, Dr. Smith. Physics--chemists and physics.

DR. SMITH: ATS and NABT.

DR. REYNOLDS: Thank you very much. Our next person to testify today is a very special person to me. This is Dr. Jerry Kollros, Chairman Emeritus of the Department of Zoology at the University of Iowa.

I will introduce Dr. Kollros by simply indicating that he was mentoring and serving as an advisor to black graduate students and women graduate students before it was the thing to do.

Back in the late '40s, through the '50s and into the '60s. Dr. Kollros.

DR. KOLLROS: The Emeritus is with respect to the Chairmanship of the Department and has a [INAUDIBLE] emeritus for the university.

I would like to do three things. I would like to say something about our department, the department, now biology, previously of zoology, particularly to the Task Force, in terms of its success in the past with producing Ph.D.s, blacks, women and now with Orientals as well. I cannot respond to the handicapped.

I will also point out that we have been unsuccessful with blacks for the last 15 years, and I will make some comments about that. And then I will have maybe a few recommendations to be considered. I have no notion how valid they will be.

The Department of Biology of the University of Iowa, formerly the Department of Zoology, has an extensive record in the graduate training of women and certain minorities.

Our first Ph.D. degree was awarded in 1905. The first to a woman was in 1920, and to date 50 more women have earned the degree in our department.

The first Ph.D. to be awarded to a black student was given in 1938. And the most recent was 1969.

I would like at this point to thank Dr. Joe Prestich for some conversations on these issues and some background material. She is currently a visiting professor in our Department of Political Science and her standard position is as Professor at Southern University in Baton Rouge.

Up to 1969, Ohio State University awarded doctorates to more blacks than did any other university in this country. Iowa and Michigan were tied for second, and our Department of Zoology awarded 23 blacks, more than any other department in the country, over that interval of time.

Iowa has a very small minority population. Therefore, I think this is an impressive record.

And how did it come about that a department with no more than two percent of the faculty would produce 23 of the 68 doctorates awarded in the '20 to '69 years?

I arrived in Iowa City in 1946 after only four of these black Ph.D.s had been awarded, and so I think my experiences cover the entire--almost the entire period, and I hope that my observations may have some merit, as they are expressed to the Task Force.

Currently, our department, our university is attempting very strongly to recruit larger numbers of all the minorities, both as undergraduates and graduates, and into the faculty.

The faculty of that period were all Caucasoid, white, one woman, 11 men. But I think they were unusual in their unwillingness to prejudge people or to judge them unfavorably until they had had a record which they had made at Iowa.

At the time I came there most of the black entrants to our graduates were more mature students than most. Many had served in World War II in the armed forces. Some of them had served also in the Korean conflict.

They had considerable drive and energy to realize their goals, and in these early years they were more mature than most. Some of them already had junior faculty appointments in their Southern schools.

There were some who came to us with minimal preparation and they did badly initially, but they were encouraged to try again and many of them did indeed succeed.

I emphasize that they were indeed encouraged. I think part of our current practice, in the guidelines we now have, are less tolerant than formerly of initially poor performances.

People don't have an adequate time to make an adequate record.

Let us point out also that during this period black students were not welcome in many schools in the South in graduate programs. Iowa in the Midwest was about at close at it could be to the South, in terms of a place for these students to come and feel reasonably secure.

Second, the first black awardees in our department, those in the late thirties and early forties, served as recruiters for the ones who came afterwards, and this is particularly true for those who went to Southern University in Baton Rouge and to Texas Southern University in Houston.

We have also had students that I can recall from Morris Brown College, from Curryview [PHONETIC], and from Fisk.

We have no records of financial support for these earliest students. We do know that some came with fellowships, such as from the Rockefeller. Some came with the GI Bill. Some came on their own.

And some had to interrupt their training to go back and work for a year or two so they could come back for a year or semester or summer session to finish up.

And I am sure that some of them had research assistantships with the professors with whom they worked. I cannot tell you how many or what fraction.

But it was not until 1954, until after 1954 that they also received teaching assistantships. And I have no notion of whether they had applied before that. But after 1954, we had teaching assistants who were black.

I think, therefore, the conditions which would be desirable or optimal for the success of candidates would be that they have to have a good deal of energy. They would have to have drive. They have to have a sense of purpose for what they are doing.

And in science I think it is very desirable for them to have an early experience in research. This means they need somebody who is their mentor, who enjoys doing the research, and who can communicate with them the excitement they have in getting this kind of background training.

Second, they need a faculty, a complete faculty, whose attitudes are open toward all serious students.

Third, they need financial support. And this is for the usual matters--tuition, books, living expenses. But in addition--and I think here the Task Force might consider this seriously--if they are going to have significant early research experience before they state on a Ph.D. thesis of their own, they need to do this with some faculty mentor and not all of the faculty in the science departments have research grants.

And therefore some support for these people would be very useful, however it is arranged.

They need an adequate period of time in graduate school to establish a credible record, and it is also, I think, unnecessary to this group to say, that a supportive local community is also important.

Such a community was very small in Iowa City. It is perhaps two or three times as great now. And I think very importantly so.

The record of the Department of Zoology, by decade, 1920s--21 Ph.D.s, four women; 1930s--31 Ph.D.s, two blacks, four women; and so on down. And you can see that the peak of the Ph.D.s was in the 1950s. We are now someplace near an average of 40.

The last black Ph.D. was in 1969. Please note that the Orientals or Asiatics have come in and they are now a continuing part of our graduate program. There were no black women who completed doctorates in our program.

I think it very useful to point out that over the period of time after the 1960s blacks could enter graduate programs in the South in a way that they could not before.

They also, I believe, perceive that they have other professional occupations which are now open to them to a greater degree than they were before, in science or technology, or in medicine, or in dentistry, or in perhaps some of the related health sciences.

At the time of this transition, late sixties and early seventies, our department, in fact our university had very little money to spend on recruiting people, and particularly recruiting minorities.

There has been a change in this. And a particularly new program is being offered for next year, with support being requested of the--through the regents of our state government for about a million and a half dollars in this Opportunity Iowa program.

However, by the late sixties and early seventies, reports on academia, particularly by Dr. Cartter--not James, the man with the two Ts, Cartter, indicated that by the 1980s there would probably be a glut in terms of numbers of Ph.D.s available for academic programs, for academic positions.

And as a result, our department, believing this, and having had an influx of new young people, decided that they would tighten their standards. They would be looking more at the grade points of students who were entering.

They would be looking at the GRE examination scores [BELL] more critically than before, and as a result I think we have failed to recruit as many minorities as we might otherwise have done.

I think there is no particular problem with white women, nor at the moment with Oriental women, but there certainly has been with the blacks.

I think the two aspects this Task Force, from my point of view, might recommend would be specifically financial support for the student himself or herself, and, as I have indicated earlier, financial support for that research program of the student's mentor, so that the student could have an early and significant research experience. Thank you.

DR. REYNOLDS: Thank you, Dr. Kollros. Yes, Ms. Winkler.

MS. WINKLER: How did the job market turn out after that decision made? Was there in fact a glut of people?

DR. KOLLROS: I think Betty Vetter could answer that much better than I could. [laughter]

MS. VETTER: And still is, a glut.

DR. KOLLROS: [INAUDIBLE] moderate department is going to view, in the area of ecology. I think the people in genetics and development, for example, have had no such problem.

MS. WINKLER: Could I just follow up on that? The employment history for the black Ph.D.s and women Ph.D.s, from your perspective, Dr. Kollros, how has that gone?

DR. KOLLROS: I don't think there has been a problem.

MS. WINKLER: They have all been, have found good positions.

DR. KOLLROS: Yes, and in fact we have black, we have additional women on our faculty now. We have had three, we have had as many as five at one time. We have lost some of them because they have gone with their husbands to new positions, not because we cannot otherwise keep them.

We wanted to keep them, but they have had positions. My impression is that qualified black candidates would have no problem at the present time.

DR. REYNOLDS: Do we have other, other questions on the group?

I would like to indicate--I didn't want to say this before, Dr. Kollros testified [INAUDIBLE] up there in the 1966 women's section, and Dr. Kollros was my major professor.

And clearly an extraordinary effort on behalf of women and on behalf of black students. I think Dr. Kollros personally produced more black Ph.D.s and more women Ph.D.s than any other major professor in the United States.

Clearly, we need more people to compile a similar record.

And in fact, I think we were the--women and blacks were the majority of your graduate students during some of that period, were they not? Or close to--just over 50 percent white majority, good. Thank you very much.

We will proceed then with the next individual. Dr. Don Ahshapanek. Is he here?

DR. AHSHAPANEK: Ah-sha'-panek.

DR. REYNOLDS: Oh, I'm sorry, thank you--Ahshapanek, from Haskell Indian Junior College in Lawrence, Kansas.

DR. AHSHAPANEK: First I would like to take the opportunity to thank the members of the committee for inviting me to participate as an American Indian scientist and a teacher in a school exclusively for American Indian students.

We have an enrollment of over 800. I think that I am somewhat qualified to say some of the things that I want to point out to you this afternoon.

The United States, over the past 50 years, has spent much of its effort in providing economic and intellectual opportunity for the majority of its citizenry. It has been in our national interest to keep equality of access, unlike many other nations where there is a great difference between those who are wealthy and those who are not, those who are literate and those who are not.

With these efforts, we have been able as a country to maintain some degree of stability. Yet for many of our citizenry in this country, equality of access has been less than rewarding or satisfying.

With a reduction in emphasis on targeted programs by the present administration, federal attention in the areas of science and math have been left with the training of American Indian students in the existing pool at the graduate level.

But with so few American Indian students in this pool to begin with and with few existing programs in the areas of science and math designed to increase that pool, the impact upon Native Americans in our communities has been anything but promising.

Our American Indian communities are facing a critical shortage of native men and women seeking access to training in a variety of professions, all the way from medicine, engineering, architecture, to education, information technology, and business management.

For example, our best evidence would seem to indicate in the field of medicine over 1,000 native physicians are needed to reach parity.

In veterinary medicine, over 100 are needed to reach parity. In nursing, over 2,000 RNs are needed to reach parity. In dentistry, over 400 are needed to reach parity.

In optometry, over 50 are needed to reach parity. In clinical psychology, over 100 are needed to reach parity. In engineering, over 4,000 are needed to reach parity.

In architecture, over 200 are needed to reach parity. In business management, over 100 are needed to reach parity. In law, over 800 are needed to reach parity.

In geology, over 100 are needed to reach parity. In forestry and environmental biology, over 100 are needed to reach parity. In public elementary and secondary education, over 8,000 are needed to reach parity.

In higher education, including professional faculties, over 1,500 are needed to reach parity.

Now parity assumes that the needs of our American Indian communities are much the same as they are the non-Indian population and reflects a minimum number needed.

However, we lie far behind in social and economic benefits which would tend to increase that number.

Within all of these areas, less than 2,500 students are currently enrolled, and most are just beginning programs which many may never finish because of a plethora of barriers which I will talk a little bit about later.

The need for these skilled individuals is dramatized more than just by the desire to reach parity with a non-Indian population. For example, in the area of health in the Indian Health Service, only four percent are--of the MDs and dentists are actuall~~t~~y Indian.

Only 31 percent of the RNs are actually Indian. The patient staff ratios are higher than the national average for Indians in all three of these areas.

Of the Indian Health Services' 45 hospitals, 35 are now accredited. However, 10 of those still not accredited due to the lack of adequate staff.

With the Indian youth's suicide rate at three and a half times the national average and cultural conflicts decreasing the effectiveness of the non-Indian therapists, there is an increased need for American Indian clinical psychologists.

In education, only 16 percent of the Bureau's teachers are Indian, and slightly over one-fourth of the 300,000 Indian children have any Indian teachers as role models.

When we consider the need to prevent erosion of treaty rights--this involves fishing and hunting, water rights, land claims and settlements, and the need to administer tribal courts, the necessity for law students becomes quite evident.

In the area of engineering and natural resources, we can see the need for skilled individuals in these areas when we consider that 40 percent of the nation's known coal deposits occur on Indian lands.

In addition, we are now asked to manage uranium, timber, oil, gas, and water resources that provide our tribal groups with a considerable portion of their revenues.

With the young Indian population compared to the national average and 25 percent of the housing for this population now considered inadequate and overcrowded, the need for architects is readily apparent.

All of these areas require a competency in science and math, and yet as a nation we inadequately provide the preparation, we inadequately provide the encouragement, and we inadequately provide the means of access for future Native Americans to fill these professions.

Applied science in our communities is a basic need. We need trained native personnel to assist Indian communities toward the federal and tribal goal of self-determination, and the need for them is to solve real life problems.

Now I won't go into the barriers. Those have been well documented by several people, such as Green and Locke and Shanantonah and Smith. But these include a lack of financial support, some of it poor and inadequate academic preparation, family and marital problems, cultural conflicts, poor study habits, inadequate academic counseling, lack of societal and family support systems. few visible and positive role models, and a lack of awareness concerning career opportunities.

And in order to cope with these barriers and the problem with disparity of numbers, as I have outlined earlier. the Department of Education and the National Science Foundation have a few programs that address themselves to the needs of our people and communities such as the ones that you are addressing yourselves to in this group.

The BSCS concept of teaching biology through problem solving, socratic techniques, discovery learning and inquiry--though these have been proven of invaluable impact in a modern technological society--are rarely taught to most of our Indian students.

School mathematics is not keeping pace with the changing technologies, and in many of our high schools where Indian students receive training, no mathematics is taught beyond the ninth grade or students are not encouraged to take mathematics beyond that point.

In checking with the tribally controlled community colleges and those of the Bureau, more than half of the present instruction in math is directed towards the developmental skills which should have been learned in high school or at least in grade school.

Computer technology is rarely available, although the impact of the computer in our society within the next decade or two may far outweigh the impact of television.

Since our students have difficulty in even reaching undergraduate education, much less graduate levels, recruitment, counseling, and motivation strategies are needed to increase and enlarge the pool of potential students at the pre-college and undergraduate levels.

Once the students are in the pool, support systems are necessary to insure their continuance. The student needs help to develop good study habits, a supportive atmosphere in terms of role models, counseling, tutoring, and et cetera.

Work experience which is tied in with career motivation needs to be developed through the interfacing of state, federal agencies, industry, and corporations. But at least with some empathy.

When private industry provides scholarship support, students tend to go to work for that company. So it doesn't help tribal groups much at all.

Also many companies providing support for individual Indian students are at the same time conducting business on Indian lands that is destructive or at least counterproductive.

And I could name you many examples of that, such as McDonell Douglas, Bechtel, Peabody Coal, and so forth. Such does happen--some of the bright spots in the picture, though, are evident, as exemplified by programs such as the Headlands Indian Health Careers Program.

The Indians into Medicine Program, the MESA program, the Mathematics, Science, Computers, and Language preparation for elementary and Secondary Teachers Program such as Dr. Smith is involved with.

The U.S. Forest Service has some cooperative programs that they have set up now, and even in this latter program, though, the efforts are all too few, or they are endangered by lack of funding, even when they have a proven track record.

It would appear that ongoing NSF programs might be impactful if guidelines for eligibility were relaxed. For example, just one point, consider the International Cooperative Scientific Activities program, is there really any difference between an independent Indian--American Indian tribal entity--which might gain support because of common ownership of land to develop its scientific capability versus, let's say, any other independent nation under this program.

Indeed, the Bureau of Indian Affairs might even be singled out as a separate entity to receive funding, just as the Department of Education presently does.

Some programs under NSF, for example, the College Science Instrumentation Program, have restrictive clauses, which deny eligibility of two-year community colleges, of which there are over 20 of these serving American Indians, just as our college does.

And all of us are under the general umbrella of the American Indian Higher Education Consortium, or AIHEC. Many of these are tribally controlled colleges with no direct access to these programs that would benefit them greatly.

Instead, to gain acceptance, they must often go through a four-year institution, in order to gain that credibility or acceptance, where monies are reduced drastically by high overheads of the grantee university before they ever reach the Indian college, or for that matter, even the Indian student.

Why not have those funds go to us directly? Our colleges hold accreditation through the same validating systems as yours do. Even if eligible, in a program such as the College Science Instrumentation Program, the very items that we need, the nuts and bolts of our curricular pattern in order to motivate our students to increase the number in that pool, are deemed excludable items.

I might urge the NSF to find a way to support these tribally controlled community colleges and their affiliates. The programs which are targeted to other minorities just are not getting to our students.

Take whatever opportunities you have at your disposal to insure that Indian students work with Indian role models. This initiative also has its drawback, because there are so few of us in the pool to begin with.

For us, there is a continual pull from all directions. Guidance, advice, planning, management, whatever, to the extent that many of us are going out of the very paths which might have something to do with increasing that pool.

And instead, we are drawn into administrative activities that would decrease our research and advisory capabilities to our young people.

Now this may mean some special support systems or efforts for those of us already in the pool who need your help just as badly. Students need summer programs in their own communities, so that they can learn as much as possible about their own environment and see the application of science to their daily lives.

As a matter of fact, whole communities could participate in such a program.

In addition, the NSF needs to establish as one of its priorities future and ongoing education for teachers, both Indian and non-Indian, who are going to teach Indian students, especially at the member colleges of AIHEC.

In a recent interview with some 300 teachers at the elementary and seconday level--and I didn't perform this, but one of our colleagues did--not one Indian was found who had a degree in math or in any of the sciences.

White teachers, on the other hand, often did.

In addition, turnover rates among teachers in Indian schools are often very high, often reaching 40 percent. And staff development for these teachers in current and innovative techniques is also definitely needed.

Now since a good portion of our young people don't go to minority schools, NSF needs to find some ways to support these Indian students as individuals, even though the schools they attend may not be targeted for minority support.

And finally, the National Science Foundation needs to develop initiatives to support networking groups, and I want to call your attention to two such networking, the American Indian Science and Engineering Society, of which Mr. Hill is Executive Director, and the American Indian Higher Education Consortium, so that support services may reach our Indian students.

These two organizations have been very supportive of the efforts of NSF and are dedicated just as you to the increase of that American Indian pool of qualified and dedicated science and mathematics professionals.

In conclusion, let me state that these problems have been addressed previously, and I want to call the members of this group, I want to call your attention to the report by the National Science Board, 86-100, Undergraduate Science, Mathematics, and Engineering Education.

This was formulated just this past March, and many of the things that I am saying have been in that, are located in that publication, and as yet, not much seems to have been done regarding that report.

And one of the basic questions I might ask this body is why have another body reinventing the wheel?

Now perhaps I am being a little bit harsh on a committed group, yet what appears to me is that our democratic system is very slow-moving, and I realize this.

Also, I implore you to seriously consider the following viewpoints.

Number one, expenditures for programs addressing themselves to the needs of underrepresented groups, especially American Indians, remain identifiable as line items.

And number two, that funds for the upcoming budget period be not less than the previous period, but rather be increased since inflation has diminished the real dollar value over 50 percent in the last decade.

I trust the thoughts I have expressed here will assist this committee to make some judicious and insightful decisions concerning continued funding of those programs and initiatives which seek to correct inadequate representation [BELL] of minorities, especially Native Americans in science and mathematics. Thank you.

DR. REYNOLDS: Thank you, very much, Dr. Ahshapanek. Ms Winkler.

MS. WINKLER: At Haskell Indian Junior College, I wonder if you could tell us a little bit about how that works. Is that a state institution?

DR. AHSHAPANEK: No, it is not.

MS. WINKLER: Or a federal? Or who runs it?

DR. AHSHAPANEK: Haskell is one of three postsecondary education institutions funded by the Bureau of Indian Affairs.

MS. WINKLER: How are decisions about curriculum standards, outcomes, and all that made? Are they made in the institute itself? Are they made by BIA? Is there some other system?

DR. AHSHAPANEK: The Bureau has not been involved in running a postsecondary institution for very long, particularly at a college level, and when I speak about this, I am talking about liberal arts institution.

They have run a business, a postsecondary business school and also a vo-tech school, but have not had the experience in running a liberal arts college until about 1970.

We are operating pretty much according to guidelines which are established by the institution and not necessarily by the Bureau of Indian Affairs, although we have to follow most of the hiring and firing practices of the Civil Service, purchasing and so forth.

MS. WINKLER: Do you have any thoughts about that arrangement? Does it work well? Or are there ways in which it can be improved?

DR. AHSHAPANEK: I don't know whether I can answer that question, being a Civil Service employee.

MS. WINKLER: Well, I am a bureaucrat and I [INAUDIBLE] problems with bureaucracy.

DR. AHSHAPANEK: I would say that there are some handicaps to the system as it now operates.

MS. WINKLER: Inflexibility?

DR. AHSHAPANEK: Inflexibility, yes.

DR. REYNOLDS: Mr. Hill and then [INAUDIBLE].

MR. HILL: Two points, Don--would you recommend set-aside dollars for Indian tribes at junior colleges and organizations to promote scientific education [INAUDIBLE] and culd you speak a little bit about [INAUDIBLE] at Haskell teaching teachers how to teach science.

DR. AHSHAPANEK: The answer to the first question is yes. The answer to the second question--I would rather have Dr. Smith, since he has been involved in this program more than I have, in teaching--those teachers who are teaching American Indian students.

We have had this on our campus now for the past two summers, and if he would like to comment or if you would like to hear him comment on that, I would be happy to have him do so, if he is still here.

DR. REYNOLDS: Dr. Smith, could you give us just a quick response to that? We would appreciate it, thank you. There is a microphone right there.

DR. SMITH: Well, there are funds that are under the Education [INAUDIBLE] Security Act, some of which is set aside to go to the BIA, and in turn they have funnelled a good deal of those funds to Haskell.

In the last three summers, there have been I think 282 teachers in kindergarten through the ninth grade come to Haskell, each of them there for a two-week period, and about half of that time is devoted to science instruction and science education instruction and math education and instruction.

It has been a very good relationship, and I almost feel embarrassed because [INAUDIBLE], and there has been a good [INAUDIBLE] relationship between our university and Haskell, and there has been follow-up activities in the field for those teachers.

DR. REYNOLDS: Dr. Danek.

DR. DANEK: I am from NSF so I--I am not aware of where, what the current status of the recommendations, the specific recommendations that you made, I will look into them.

I will tell you that we did make one of the changes, that is, the College Science Instrumentation Program is now open to two-year colleges. So that has been changed.

I will be glad to take a look at the organizational problems that you stated with regard to the--some of the Indian institutions are not accredited, and therefore ineligible for support.

DR. AHSHAPANEK: All of the colleges under AIHEC are accredited institutions.

DR. DANEK: And why can't they apply to the NSF to the College Science Instrumentation Program directly as institutions in their own right, especially since the two year, it's open two years...

DR. AHSHAPANEK: Well, I believe this change has just come about, has it not?

DR. DANEK: Yes, this year...

DR. AHSHAPANEK: And so perhaps they have not had time to react to it.

DR. DANEK: I thought you alluded to another problem, however, which related to the status of the institutions as not being separately eligible.

DR. AHSHAPANEK: No, no, I don't think so.

DR. REYNOLDS: Are there questions? Yes, one more, Ms. Winkler, and then...

MS. WINKLER: Your graduates, do they have problems getting into four-year colleges?

DR. AHSHAPANEK: I don't, I have not heard of any problems that they have. I would say that about a third of our student body is in the liberal arts program, and that of that third, probably well over half of them are planning, or will, go on to further their education.

But this is where the breakdown often occurs, too.

MS. WINKLER: And why do you think the breakdown is?

DR. AHSHAPANEK: Well, as I would point out, I think a series of things--financial support is one of the biggest things, though--motivation, role models. All of these play an important part in keeping them.

Many people--we have a, I guess a network of supporting systems available, and when those support systems are not any longer there, then it doesn't work out too well.

For example, let me give you an instance of, the United States Geological Survey came to us and wanted to set up a cooperative program, and one of the things that they wanted to do was to take a student, and take them to Denver and then take a student and put them out on the reservation in a cooperative work program during the summertime.

And we said, no, we don't do that. It won't be successful. If you are going to do it at all, you have to take two or three students, give them something to hold on to.

And it seems to work much better if they do that.

DR. REYNOLDS: Dr. Danek.

DR. DANEK: Yes, what major state schools in the country educate the training at the undergraduate level the majority of Indian students?

DR. AHSHAPANEK: Right now, I would suspect that it is probably the members, the member colleges under AIHEC.

DR. DANEK: But outside of that, what other?

DR. AHSHAPANEK: At the undergraduate level?

DR. DANEK: Yes.

DR. AHSHAPANEK: I would hate to name all, but I would say that there are probably two or three in Oklahoma, and I am choosing the states where our populations are highest. There are probably two or three perhaps in Montana, Arizona and New Mexico, some of those such as [INAUDIBLE] University and so forth.

Some of those institutions would probably have a fair number of Indian students in them.

DR. DANEK: So you could, if you could focus on the six or seven of those schools, you could hit a very large percentage of Indian students.

DR. AHSHAPANEK: You could hit some Indian students that are outside of the targeted areas, yes.

DR. DANEK: And how many other institutions then, including the tribal instutions, would there be? In other words, I am trying to get a feeling for the universal institutions that are involved in Indian education.

DR. REYNOLDS: We should insert here California. We have three percent American Indian enrollment, which tallies up to 10,000 students, which is probably quite a few in the total...

DR. AHSHAPANEK: I just didn't get around to all the states, I'm sorry.

DR. REYNOLDS: But if, the trouble, I think, a little bit is that an enormous amount of dispersion in four-year institutions, isn't that what we are kind of getting at?

DR. AHSHAPANEK: Yes. And that is why one of the things that I recommended is the support needs to be given to those students outside of the traditional Indian colleges.

DR. REYNOLDS: Mr. Fernandez.

MR. FERNANDEZ: One quick question, in the Alburquerque [INAUDIBLE] testimony indicated that the [INAUDIBLE] weren't doing very well in the public schools, as far as [INAUDIBLE] were concerned.

But from a policy standpoint, should we lean more towards the tribal institutions and try to [INAUDIBLE] of dollars, or should we try to find some ways of using the public institutions.

DR. AHSHAPANEK: Perhaps I might say that I think, with a little bit of judicious choosing, you might be able to do both simultaneously.

I would think that you could do both very effectively.

MR. FERNANDEZ: But both ways take a lot of money [INAUDIBLE].

DR. AHSHAPANEK: Probably. But I think with some careful, as I said, with some careful choosing of those institutions, I think you could probably do a fair job in hitting both groups.

DR. REYNOLDS: Thank you. Very quickly, Dr. Ahshapanek.

DR. AHSHAPANEK: Ah-sha'-panek.

DR. REYNOLDS: Ahsha-pan'-ek.

DR. AHSHAPANEK: No, Ah-sha'-panek.

DR. REYNOLDS: Ah-sha'-panek, is that better?

DR. AHSHAPANEK: Yes.

DR. REYNOLDS: Thank you. What is your drawing area at Haskell, are you--and what tribes are you involving primarily--Cheyenne?

DR. AHSHAPANEK: No, but we have over 140 different tribes coming from some 35 states.

DR. REYNOLDS: Thirty-five states. So you have a very wide, very diverse representation.

DR. AHSHAPANEK: Yes. However, the Lakota, the Sioux are probably very high. The Cherokee in Oklahoma are very high. Those would be probably the two most common in the [INAUDIBLE].

DR. REYNOLDS: Any other questions? Thank you very much. That's most helpful.

DR. AHSHAPANEK: Thank you.

DR. REYNOLDS: We now have a few people from the floor that wish to testify briefly. We need to restrict you to approximately three minutes.

The first person is Ms. B.K. Krinzer, Society of Women Engineers.

MS. KRINZER: I decided in the interest of time to not testify and have someone from the organization testify in Atlanta, which is one of the earlier meetings, prepare a little better.

DR. REYNOLDS: All right, that would be fine. Thank you very much.

The next individual is Dr. Elizabeth Applebaum from Shawnee Mission High School.

DR. APPLEBAUM: I would like to correct that. Shawnee Mission is the post office that I get mail at. I am not employed by the Shawnee Mission school system.

DR. REYNOLDS: Oh, sorry.

DR. APPLEBAUM: I would like to tell you some of my own experiences. My Ph.D. is in mathematics. I am a member of Phi Beta Kappa. I won a National Science Foundation international competition, so they supported my education for four years.

I have been a full consultant in education. I have research papers. I have reviewed about a dozen textbooks for publishers. And I have published a textbook by a national firm in remedial mathematics.

So I know I have aptitude and dedication to mathematics.

Now I want to tell you what happened to me at a local four-year college. I was hired to work there in May of 1985. The dean emphasized that evaluation was mandatory, and I would receive an annual evaluation by the dean.

Then he left and there was a new dean. No one observed me teach, no one ever commented on my teaching. However, in February of '86, the new dean called me to his office and after I told him about the cheating I had observed--I thought that was the purpose of the call--but the real purpose he wanted me there was to tell me I would receive a terminal contract for the next year.

He said students were complaining. And I said, "What did the students say?" He said, one student said, "I'm not paying this kind of money for that kind of teaching." And I really think it likely that this student was angry about a low grade.

I appealed for reconsideration, and in December of '86, yet another dean told me that I would be let go, but it was not for professional reasons. And he did not give me the reason.

What I want to tell you people is, you cannot hope to see more people from minorities, women, and handicapped enter the sciences unless you provide role models at the colleges.

The role model can say indirectly, you, too, can be a scientist, and the role model can give some sympathy and support that not all the WASP men can provide.

And you will not get this to happen unless you enforce the laws for equal employment opportunity at all the nation's colleges. Thank you.

DR. REYNOLDS: Thank you very much, Dr. Applebaum. The next person who had--oh, excuse me, are there any questions of Dr. Applebaum.

DR. HILL: Are you teaching now?

DR. APPLEBAUM: I will be teaching at John [INAUDIBLE] Community College beginning next semester. Right now I am keeping busy with consultant work and tutoring.

DR. REYNOLDS: Thank you. Any other questions? The next person who asked to testify was Ms. Ruth Margolin, Director of the Women's Center, University of Missouri, Kansas City.

MS. MARGOLIN: Thank you, and thank you for this opportunity to share some thoughts. I have been working with women in career development, minorities, teenage girls, since the mid-sixties, and I think that there are two very important issues for now and for the nineties, and those are on the soft side of science.

And that is, the one issue is the mainstreaming of women, minorities, and handicapped people into the general society and general education versus the separatist programs that we have been talking about.

I think it is a serious concern. What I have found is that very often our young women do not want to identify themselves, nor do our minorities, as being separate and needy.

They come to our professional schools feeling that they are equal to the task, and they enter equal to the task, and therefore do not want to be separated out. But very often their academic progress is not the same as men, and there are lots of issues behind that, in terms of their socialization.

I could like a lot, I will just list a few. What we find very often in medical school is that when there is illness in the family, there is the girl who is called home, your mother needs you, your father needs you.

The boy is encouraged to stay, we will manage to take care of these things.

We find very often--we have a six-year medical school here--the girls come in at 17, 18 and their socialization is not as mature as the boys. They kind of--and they go down on Hospital Hill, we have a little inside joke that the boys put on their white coats and they are doctors. The girls put on their white coats and they are still students, asking the questions and holding that kind of a socialization pattern, and they act very much that way in the lab.

Fortunately, there are some very good support services that the med school and pretty soon that equalizes itself. But there is a lot of attrition in terms of women, particularly our female blacks, who are not able to hang in there.

Another area that I think is important. We did a recent small study looking at some of our women who have been into the professional world, out of professional school five years, particularly wanted to look at the role of the role model.

What we think we found--we're not sure--is that while the role modeling is important, it very often doesn't make the difference about career commitment. That career commitment comes along in a different way.

And what the women are seeing and experiencing is what is happening to women today, what was referred to earlier as the "supermom syndrome," what The Wall Street Journal reports out, that these women are falling away.

They are not able to maintain being a wife, being a mother, and maintaining a successful. And I think we need to pay some attention to that. I would hope that we could.

Another area is what happens in their personal lives.

And where mating and parenting is very important for them in their educational years, that maintaining that home and that family becomes a critical issue for them later.

We do have a mentor program at the Women's Center, in which we link graduate, professional and juniors and seniors with women in the community for that transition into the work community. Thank you.

DR. REYNOLDS: Thank you. Questions for Ms. Margolin.

MS. BISHOP: Are these women taking assertive training? I mean I am thinking about the woman who is, young woman who is in med school, who is getting confronted with a negative attitude as she performs her duties the same as her male counterpart.

Are they getting those types of training?

MS. MARGOLIN: Sure. It is just sometimes very difficult to stand up to a family.

MS. BISHOP: Oh, she has got to compete, it's the family.

MS. MARGOLIN: Saying, come home. I mean the issue...

MS. BISHOP: No, I was speaking more of the kind, when they go to the hospital, and you mentioned that they are treated one way and the men are treated another way.

I am wondering if women are getting assertive training.

MS. MARGOLIN: We have a women's support group, and we do talk about them, but changing behaviors, you know, is sometimes not as easy. We have done assertiveness training for a long time.

We have got some pretty good statistics, when they make rounds, the guys ask a lot more questions than the girls do in the beginning, and eventually, as I say, their confidence is built up.

We also do some special training in terms of the residency chase, and the kinds of interviews that they go out on, the kinds of questions that they are asked.

MS. BISHOP: So is it just a matter of time to build up one's confidence, that it comes about?

MS. MARGOLIN: I think that the system needs attention.

DR. REYNOLDS: Thank you. Our last individual who wished to testify is Mr. Al Kemp, Regional Director, U.S. Department of Health and Human Services. Is he still here with us? I think he left, all right.

I think that then concludes our formal testimony today--yes, sir.

DR. ~~A~~ESTRADA: I would like to take Mr. Kemp's place, if I may. He may submit a written format to you, is that OK?

DR. REYNOLDS: Certainly, you are?

DR. ASTRADA: I am Dr. Estrada.

DR. REYNOLDS: Are you with that same division?

DR. ~~A~~ESTRADA: Yes.

DR. REYNOLDS: Thank you.

DR. ~~A~~ESTRADA: Just like to make a few comments.

DR. REYNOLDS: Surely. This is Dr. Joseph L. Estrada, from the Office of the Regional Director, Department of Health and Human Services.

DR. ESTRADA: Mr. Al Kemp is preparing some remarks that he felt would be of interest to you, and all I want to share is something. I am originally from Kansas City, Kansas, to a place called Armourville.

The Armour Meat Packing Company at the turn of the century established something there, and it had a high concentration of different nationalities to begin with, but eventually it became a place where you could find mostly Mexican and then Mexican-Americans in that area.

It does not exist, per se as such, but one of the things I do want to bring up to this fine Task Force, and I thank you all for allowing me to do this extemporaneously.

One of the aspects that I have always looked upon, and I have traveled the nation and have been able to corroborate and confirm this, that area has produced the greatest amount of professional Chicanos in the United States, regarding people that are now presently at different levels, whether that be at universities, whether that be at medical institutions, or wherever.

We also have a very high percentage of professional people that are administrators, a lot of Ph.D.s. An example here is Dr. [INAUDIBLE], who is also from that particular area here in Kansas City, Kansas.

We have M.D.s, engineers, chemists, dentists, and varied other professional people.

In 1951, we had a flood there and that made people go to different places. But I think one of the most interesting aspects as I have studied through this--I am a medical doctor myself and I have a sister who is a medical doctor, one that studied engineering.

We are all college graduates. But that is only one family. There's others that I have been able to find throughout the nation who are Ph.D.s in different areas.

I think one of the things that we found was the fact that we had to fight off a conditioning process in which we were not allowed to participate.

I, myself, am a product of a segregated public school and a segregated parochial school, in which here in Kansas City, Kansas, that is what we had to undergo.

We were not allowed to speak the Spanish language. We were only encouraged to speak English. And there were things that we could not do in the community, such as go to restaurants and eat there.

We were totally segregated. One of the aspects, I think, that has helped all the people who came from there is the fact that we did not allow the conditioning process to take place. We were shown by our parents and other people, who accepted us in a loving way, how to be assertive and how to be affirmative about many situations.

I can only say that, as I grew up and others grew up, there were people who thought that perhaps my capacity and capability was very limited. In fact I took a state Employment Security Division of Missouri test back in 1957, and they claimed that all I could do would be to work at an assembly line here in Kansas City.

And it is that type of thing, you know, where the professors and teachers that I had were very encouraging and always affirmed the things that they saw in me, and that is a type of acceptance that people have to undergo in order to be able to develop some character and some personality and keep on going.

I don't attribute all this to nonminority people, because there's beautiful nonminority people as well as minority people.

I don't think it is a thing of ethnic or racial origin. I think it is just a thing of what perceptions people may have of what we are capable of doing.

And once we are able to surmount those difficulties and do away with the conditioned process that people try to impose on us, then we can come out and of course do those things that we set out to do.

And I do believe that it takes a lot of hard work. I do believe it takes a lot of commitment, a lot of dedication, a lot of understanding, and a lot of help on the part of all the parties involved. I can still remember the [INAUDIBLE] Brothers after the test that was given to me, they said, no, that's not possible. That lady is totally off base. I have taught you for four years, I know what you can do.

Just about a month ago I ran into one of the teachers that I had--in fact, two of the teachers that I had. But the biggest thing that I found was the encouragement at home through my father, through other people in the community, and I always find that it is impossible to reconstruct this because there is no more Armourville.

But I can only go through the products of that particular community, and you can find Dr. [INAUDIBLE], Dr. Cora Jones in Iowa, Dr. [INAUDIBLE] and other people in California that are products of this type of a situation.

Thank you very much.

DR. REYNOLDS: Thank you, Dr. Estrada. Any questions?

MR. OAXACA: I would only like to comment that it was the cold weather that kept you moving.

DR. REYNOLDS: Thank you, Dr. Estrada. I think that concludes our hearings now in Kansas City. We thank you for coming, for listening, for participating. Our group now will move over through the brown doors over to the other room.

[END OF PUBLIC HEARING]

[BEGINNING OF AFTERNOON CLOSED MEETING]

DR. REYNOLDS: For California now. I am sorry it has been so late. We were suggesting to set the date for the 21st. Thursday. Do you prefer the 21st or the 14th?

SEVERAL PEOPLE: Either one is OK with me.

OTHERS: The 14th would be beautiful. The 14th would be much better.

DR. REYNOLDS: Do you have calendars? Could I get a quick vote? The 14th or the 21st of January? Let's have a show of hands then. How many people could make it on the 14th, raise their hand?

How many people could make it on the 21st? OK, I think the 14th looks a little better for this group. We're going for the 14th, the group seems to prefer the 14th.

To let you know about that event, because Los Angeles is so complicated, what we are tentatively planning to do is to house you all at a Los Angeles airport hotel. There are quite nice hotels along there in that strip, and that we will have the hearings at the Mingus Hills, the California State University campus, which is not more than about 15 minutes from the airport, and has pleasant facilities.

If it works--it may not--if it works I would love to have all of you to my home for a buffet, cocktails and a buffet dinner the night, and we will try very hard to do that.

?: The California meeting, is it a one-day meeting?

DR. REYNOLDS: Yes, it would be hearings on Thursday, January 14th. [discussion of flights]

MR. HILL: Do have a lineup of potential people to provide testimony yet? Are you assembling that list?

MS. KEMNITZER: We have a long list of people who are interested, but we are happy to get any of your suggestions, as well. And then we will sort through them to be sure we have--try to achieve a balance of the topics that are covered and the people who are represented.

So feel free to give any advice on witnesses.

DR. JENKINS: By the way, whether people will testify or not, are they encouraged to submit papers to you?

MS. KEMNITZER: Oh, yes.

DR. REYNOLDS: We had wanted to spare you all a little bit of time this evening so we could cover a few items. I think emanating from this would be one of the points that comes to mind is just what we were moving in on.

Are there types of testimony, areas, aspects, that this group feels have not been adequately addressed yet, so that in the remaining hearings, we can make sure that they come up.

MS. WINKLER: I think the whole area of the handicapped has been inadequate.

DR. REYNOLDS: I Think you are right.

DR. SCADDEN: In California, the suggestions that I made back seven months ago before the process was heavy on the area of disability from California. So I think that we can have an overrepresentation.

MS. WINKLER: Particularly in employment. I mean we have nothing at all.

DR. REYNOLDS: OK, I think that's right.

DR. JENKINS: We haven't had much in employment at all, nor promotion of people once they get on board [INAUDIBLE].

MS. KEMNITZER: May I just say one thing on that point. We have approached several people and asked them to testify, and they have declined, on that employment.

?: Public side or private side, both?

MS. KEMNITZER: On the private side. So let me--but you all have got contacts that I don't have, so let me call upon you to give me advice on who we could get to testify to those points.

DR. REYNOLDS: Jim, didn't you say you had contacted people in the private sector to talk about that, and they were just reluctant to testify?

MR. BIAGLOW: They were totally reluctant. I approached most of the aerospace industry--Boeing, Pratt & Whitney, General Electric--and they would talk like programs, like [INAUDIBLE] or Southeast and everything else.

And I said, fine, great program! You are actively involved, your sponsorship, they went on to state what they did.

They are great to talk to on the phone. I said, fine, would you like to testify--no.

DR. OAXACA: Well, why don't you have the affirmative action government people to come in and check us all the time. They've had all the numbers.

MS. KEMNITZER: That is what Mr. Thomas said this morning. He is going to get the heavy...

MR. OAXACA: Yeah, get Tony Gallegos.

MS. KEMNITZE: That would be good.

MR. OAXACA: Tony Gallegos.

DR. ADAMS: Don't bring that guy, that guy insults me now, don't bring him. I don't need no more insults from that guy.

DR. REYNOLDS: Which guy should we [INAUDIBLE].

?: [INAUDIBLE]

DR. ADAMS: No, I'm talking about the other guy, what's the other guy?

?: Oh, he's not--Pendleton.

DR. ADAMS: Pendleton, that's [INAUDIBLE--several people talking at once].

DR. REYNOLDS: He is the Civil Rights Commissioner.

DR. ADAMS: I thought that's who you were talking about.

DR. REYNOLDS: No, no, no, no. [Several people talking at once.]

DR. ADAMS: I tried a couple of times to hold my peace. I don't think I could do it another time.

MR. OAXACA: One of the things that is coming across to me is that we are going to have to recommend some structural changes to the educational systems that are pretty basic, and it occurs to me that we haven't had somebody that is an expert that will come in and tell us what that might entail.

DR. REYNOLDS: What about a principal from a high, minority high school who really has does some interesting things that have been--and can make the recommendations.

What you are talking about is what should happen. Why don't we have somebody who has..

MR. OAXACA: Yeah, I mean what is the K1 through K8 have to put together as a spec, so that when they go on to the high school, they are already up and running, as opposed to now coming in with MESA at that time and trying to...

DR. REYNOLDS: There is a fine woman, black woman educator in Los Angeles, Jewel Boutay [PHONETIC], who is institute [INAUDIBLE].

What we want is someone, if I am interpreting you right, who has really developed some things that work and could make policy recommendations.

DR. JENKINS: How about Dr. Morris, Stone, Harrison, or somebody up--Richmond, Virginia, he would have to go all the way across the... [Several people talk at once]

MS. WINKLER: Sue, if you will get in touch with me, we collect people like that, kind of in our office, it's one of the things we do. We have some in that book on [INAUDIBLE].

DR. ADAMS: The superintendent from Cambridge would be--I can't think of his name, I've got it in my office--would be excellent.

DR. OAXACA: You got [INAUDIBLE] the co-op stuff under Warren Baker up there in [INAUDIBLE].

MR. FERNANDEZ: I think another area in California, since you brought it up last meeting, is perhaps somebody give some assessment of the two-year institutions, because that is going to be very, very important.

DR. REYNOLDS: It is kind of a grim story right now, as you know, but shall we include [INAUDIBLE], just lay it out, OK.

MR. FERNANDEZ: Because the other states are trying to find ways of solving problems. They don't know what the problems were in California. We had the test tube. We are going to make the same mistakes.

DR. REYNOLDS: You would want someone--in California right now the community colleges are where most minority enrollment is going, but also where most of it is lost. So you want someone to lay that out.

DR. ADAMS: I would like to have this group hear the guy that, from the Postsecondary Education Commission that did the MESA study. I thought that was a--I heard him make a presentation on that.

?: Who was that?

MR. OAXACA: Was that Rex Fortune? Rex Fortune...

DR. ADAMS: Well, he is in Sacramento, for the, you know, you hear so many names...

DR. REYNOLDS: Yeah, but who, what commission did he?

DR. ADAMS: He did the study for the--the General Assembly wanted to know, since we...

DR. REYNOLDS: In California?

DR. ADAMS: In California--since we have been kicking this money into MESA.

DR. OAXACA: Was he a legislator?

DR. ADAMS: No, well, he works for the Postsecondary Education Commission.

DR. REYNOLDS: Oh, are you talking about Jerry Hayward?

DR. ADAMS: That's the guy!

DR. REYNOLDS: Oh, Jerry Hayward would be excellent, would be good...

DR. ADAMS: He would be excellent, and this group ought to hear him because...

MR. OAXACA: What is his topic?

DR. REYNOLDS: Well, he is the former Chancellor of the community college system. He could do us a twofer--the community college system and the MESA thing.

DR. ADAMS: And then secondly, the other thing I was going to say is I think this committee, this Task Force, needs that report, because what it does is, it says that interventions such as MESA does in fact work, and this was done by an unbiased, outside observer.

He went in thinking that it wasn't--you know, didn't expect it [INAUDIBLE], you pump all this money in and he was going to show it didn't do anything. And what it showed was the fact that who went through the MESA program, retention rates were higher than--and we keep asking that question, does the thing work? And it does work.

And I think we have got to get that on the record someplace, and it has got to be validated at that level, and that commission did that. So I would like to have it.

DR. OAXACA: You know, we have not had anybody testify about kindergarten to the eighth grade, and the issues of getting qualified science and math teachers at that level, adn what salary rates should we--the thing in California that kills you is that everybody is everybody and everybody is equal and therefore you pay a geography teacher or a P.E. teacher, a basket weaving teacher that same as you pay a math teacher.

And that is not the way it is in industry, so they go and get 10 grand more a year working for industry.

MS. WINKLER: There is also a company that did a study for us on alternative certification, Policy Studies Associates. They are in D.C., but they may know some contacts.

That's another whole route of trying to find different ways of finding highly qualified teachers is another angle to...

MR. OAXACO: How about Lucy Palomino who now heads up the...

MR. FERNANDEZ: She is up in San Francisco with the Assessment Center.

DR. REYNOLDS: Oh, Lucy who is working for ETS, I know her.

MR. FERNANDEZ: The ex-ambassador to Honduras.

DR. REYNOLDS: Yeah, she is newly there. She may not have anything to talk to about yet. She just came into the ETS. She has been down to visit us and spent several days. I like her a lot.

Bye bye,thank you, [INAUDIBLE]

DR. CLUTTER: I think we definitely should have someone from the Lawrence Hall of Science, Marjorie Gardner or Nancy Kleinberg--they have done remarkable things in science and mathematics.

MR. HILL: Someone from Alaska addressing rural isolation.

DR. REYNOLDS: That is a good idea.

?: That is a good idea.

MR. HILL: Because we are talking about all this urban stuff, but I think we need something else.

DR. REYNOLDS: Rural isolation.

[Several people speaking at once.]

DR. CLUTTER: California is the land of start-up companies in high-tech, science.

MR. OAXACA: So [INAUDIBLE] flash and trash.

DR. CLUTTER: I think we might need to hear from somebody who might represent some of those companies.

DR. REYNOLDS: That's a good, there's a...

DR. CLUTTER: To talk about what the opportunities are for women and minorities and disabled.

DR. REYNOLDS: We could get--we have one person who would be a good [INAUDIBLE], the incoming CEO of Apple. Remember that big Apple go around [INAUDIBLE], this guy named Yokum. Yeah, Del Yokum. He would probably come to--the other possibility who is a bit of a wild-eyed guy is Kirk Raft of Genentech.

[Several people speaking at once.]

DR. ADAMS: I have a different name that I would give you in terms of validation of something, and somebody who I think has thought about this. I would like to see if we can get Cy Ramos from TRW to come.

He is [INAUDIBLE] science bulwark. He has thought about the whole notion of competitiveness and competition. He has thought about women and minorities in this whole scenario, and he would be excellent if we could get...

MR. OAXACA: And have him address the issue of how do we get corporate America to turn on all at once?

DR. ADAMS: Right, and him saying it would mean a whole lot, so if I was going to put somebody...

DR. SCADDEN: He is also one of the top people in the Electronic Industries Association which would, his statement could really impact with one of the largest trade associations in the world.

MR. OAXACA: And not only that, have his statement now be part of the advertisement by every company...

DR. ADAMS: Yes, so I...

MR. OAXACA: Cy Ramos says.

DR. ADAMS: And as a matter of fact, if he agrees to do it, you can tell him ahead of time what it is you are attempting to do, specifically he would want to know--what are you trying to hit on? What audience do you want to try to tap?

MR. OAXACA: I gather you are going to be making that call?

DR. ADAMS: No, I am not going to make that call. [laughter] He is not a personal friend of mine. [INAUDIBLE]

DR. DANEK: I would like to throw another thing out as it relates to Cy Ramos, and that is--and I have been thinking about how we might do this--the NSF tried to develop visibility, concern for research quality in 17 states in the country.

Those are states that aren't doing as well as they could in terms of funding science and technology and competing at a federal level. They are the lowest in the country, in terms of the ability of scientists and engineers to complete.

And we called it the EPSCOR program, the Experimental Program to Stimulate Competitive Research. And the initial problem was to try to build a base of support within a state which went beyond the institutions and the people, went into state government, went to--just a very broad-based support for science and engineering.

And we have had, a number of people have been really successful in it. And we went before the National Science Board, Cy Ramos said that he was against this program, but after looking at it decided that it was an excellent mechanism for beginning to build a base of why we need a strong quality education and training.

So this fits in pretty much with that, and what I would like to do is to see whether or not we could tap into this kind of network that we have in some of these 17 states as an experiment, and ask a few of those people who are involved in trying to build visibility for science in general to come in and say how they might be willing to talk about building a statewide visibility for this whole issue also.

And I have in mind a couple of people that I would ask, invite [INAUDIBLE--someone coughing] for research at--Bill Sibley, who I think you know, Ann, Bill Sibley at Oklahoma State.

And they are also taking a look at how they could use this network that they have to work with minorities, particularly Native Americans in science and engineering. So a couple of those people I think I would like to see.

DR. REYNOLDS: Or maybe one [INAUDIBLE]. Other comments that--you have already described a very full, full...

DR. JENKINS: I was going to ask you, has [INAUDIBLE] done anything in the state of California in terms of this elementary and secondary schools, elementary schools in particular?

DR. REYNOLDS: Oh, yeah, they've been very active--of course, he and the governor had a horrible fight. Bill Honing is delightful, do you want to try and get...

DR. JENKINS: Well, I was thinking if he has some suggestions to turn the educational system around, we ought to be listening...

MR. OAXACA: Don't tell Deukmejian that Honing is going to be there, because neither one will show up.

DR. REYNOLDS: But Deukmejian is not coming. He is not coming.

MR. OAXACA: Get Honing.

DR. REYNOLDS: Do you want to go ahead and try to get Bill Honing?

DR. JENKINS: Sure, sure.

DR. REYNOLDS: OK, Bill would come if we [INAUDIBLE]. We'll try to get Bill Honing.

MR. OAXACA: Have him give a pitch on how screwed up Deukmejian is.

DR. REYNOLDS: But I think your point is a very good one. Let's have him talk about this area that we are interested in so much, is the elementary and the need for...

DR. JENKINS: Right, what needs to be done. And there are some people now who are saying that the Headstart data is just tremendous, and I don't know what we could do as a group to go back and see where the projects start falling through on Headstart, and increase support for...

DR. REYNOLDS: Do you know Maxine Waters?

DR. JENKINS: I don't know her personally.

DR. REYNOLDS: Would we want to try to get Maxine Waters to talk about Headstart? She is that leading legislator who is a--if we can get her, she is electrifying.

MR. OAXACA: Oh, yeah, she talked everybody out of shape when she told all the athletes they better get at least a C. The coaches went unstable in California. They didn't have any players anymore. The next day they were out of players [INAUDIBLE].

DR. REYNOLDS: Let's try for Gus Hopkins or--what, I guess what we are saying is a political figure would be all right for this group if we could find the right one--Gus Hopkins, Maxine Waters, someone who...

DR. JENKINS: You do have a full slate there.

DR. REYNOLDS: Who does care about early childhood education.

DR. JENKINS: By the way, we were talking to a couple of ladies from the Women's Bureau, and asking about the Brock study, 2000...

MS. KEMNITZER: Workforce 2000.

DR. JENKINS: I think you ought to be able to get a copy for every one of the members.

MS. KEMNITZER: I have asked and they have declined to give them to us.

DR. JENKINS: Did they say why?

MS. KEMNITZER: No, but I'll take another shot at it.

DR. JENKINS: Oh, that's disgraceful. Have you talked directly to the head of the Women's Bureau.

MS. KEMNITZER: I have talked directly to the head of Project Workforce 2000, yes.

DR. JENKINS: It has all the stats in it, the jobs that are anticipated to be...

MS. KEMNITZER: I have one copy and I will get it xeroxed for everybody.

DR. REYNOLDS: Yes, Deborah.

SHAPLEY
MS. ~~SPRALLEN~~: Can I just interject a comment. I have to say, as someone who has to read it on behalf of all of you, that the submissions that these witnesses are giving, with their prepared testimony, are some of them unbelievably excellent.

I am speaking specifically--well, there are many cases, but the outstanding case that arose today was when Nate Thomas refers to Neblitt's testimony, and I'm sorry the summary you have of the Chicago hearing doesn't quite do justice to it.

But Neblitt and then the other black engineer guy who testified later--his name. [Several speaking at once] Curt Wright--he was excellent, but let me tell you that some of the files that are coming in to the Task Force office.

For example, the Neblitt material included a thick report, beautifully presented by that organization, that listed interventions.

DR. REYNOLDS: Good.

MS. SHAPLEY ~~SPRALLEN~~: And evaluated the problems and the social factors and everything, and I was sitting there, flipping through, saying, great text.

But what I want to say is--I want to make two comments. Number one, I hope that members of the Task Force, if I could just plea from that staff point of view, will somehow make the time to examine some of those materials firsthand, because they have been given to you, you know, with the understanding that you would take them into consideration.

And I really don't think that I should only be the filter, and I can't do it in a few paragraphs. And I would be glad if, we can be glad to highlight certain ones of them, but I don't know how, what mechanism we can use.

The material is bulky. Perhaps at the next meeting, I could bring some of them, and people could just sit around and read them.

Secondly, I think, just talking for myself only, that the more people that the Task Force gets interested in testifying, and particularly the more illustrious or people who are leaders in this area in one aspect of it or another, the better.

In other words, as you pointed out this morning, the credibility of the group grows the more people we hear from and the more open we are to people.

Now one of the effects of that is that if we have too many people or people who should testify and we don't have slots for them, there ought to be some way, not only of getting their statement and reassuring them that their views will be taken into account.

But I think of you all genuinely interacting with whatever it is that they submit. And I will put into the summaries material that comes in for the record, but that is not, that are not from people you meet at the hearings.

So I can give you a few paragraphs, but I think the Task Force should consider at some point how to deal with the fact that you can and should get a whole lot more material from people whom you won't hear from necessarily at the hearings.

Anyway, I don't have a practical suggestion for either, on either count.

DR. REYNOLDS: Sue, any ideas there?

MS. KEMNITZER: Well, as a start we will summarize the written material that we are receiving, treat it as though it were testimony that we received at the hearings. So that will be incorporated in the hearings summaries.

And then.

MS. SHAPLEY ~~SPRALLEN~~: Well, we can work something out.

MS. KEMNITZER: I think we will have to, at some point, go through all the material we have gotten and divide it up according to the Task Force subcommittees, and perhaps the onus should be on us to let the subcommittee co-chairs--tell the subcommittee co-chairs to digest this information somehow.

MR. OAXACA: Sue, what are your thoughts on perhaps between the January meeting and the one afterwards to have a one-day in Washington working session, where we just sit around in a room, put that on the table.

I think we have got to have something like that to start, you know, because I don't believe that Deborah is going to want us to start closing.

DR. REYNOLDS: From a travel-logistics point of view, it might almost be better to have a two-day session in California. I plead having another trip all the way across the country for all of us is really hard.

DR. JENKINS: Make it Wednesday and Thursday, if you do, not Thursday and Friday, please.

DR. REYNOLDS: Well, maybe not in California, maybe with the Atlanta hearings, or maybe one of the others, to have a two-day session to catch up on our work.

DR. JENKINS: I was going to make another suggestion as well. Sue, have we kept with Richard Neblitt to see if he is willing to share enough copies for the members of the committee, because there is some background documents that are so immense and cover so much that it might be good to have a copy for everybody.

DR. REYNOLDS: OK.

MR. OAXACA: Are those available at your office, Sue, for us to read when we come into town?

MS. KEMNITZER: Sure, right.

MS. SPRALLEN: But there is one copy of each thing.

DR. JENKINS: Right, I think that that's what we ought to do, where we can get them, where we can get them.

DR. REYNOLDS: As I said, we will try to work on summarizing all this now. We will try to work on information flow. Some of it will go to the committee chairs, some of the more spectacular documents, we will try to get copies for everybody of.

We will try to attach a work day to one of the meetings.

MS. KEMNITZER: Could we decide on that now, because...

DR. ADAMS: Yeah, let's decide on that now. That would be easier to do.

DR. REYNOLDS: I can't work the previous day, the 13th, because that is board of trustees, so that the California time is difficult for me.

DR. ADAMS: Let's do it with the Atlanta one. The Atlanta one is on a Wednesday.

SEVERAL VOICES: What date is that?

DR. ADAMS: It is on the second of March. The Atlanta meeting, the Atlanta meeting is on the second, which is a Wednesday.

DR. REYNOLDS: We are now looking at Wednesday, March 2nd, is that correct?

DR. ADAMS: And what I'm simply saying is, do we need?--why don't we arrange that so we can come that morning. In other words, we don't need a whole day, but can't we start and go 12 o'clock on.

DR. SCADDEN: Why do we jump from January to March?

DR. ADAMS: Because some people said we couldn't do March--January was a bad day for people.

DR. SCADDEN: What happened to February?

DR. ADAMS: We don't have a meeting in February.

DR. REYNOLDS: What I am hearing now is perhaps arriving on Tuesday morning and working Tuesday afternoon and then having the hearings on Wednesday?--is that what I'm hearing?

DR. JENKINS: We could even work Tuesday night.

DR. ADAMS: Yeah, I was going to say [INAUDIBLE].

DR. REYNOLDS: What about Thursday, March 3rd, is that?

DR. JENKINS: Wednesday and Thursday.

DR. REYNOLDS: What about Wednesday and Thursday?

DR. ADAMS: Well, see, we're still going to have to--the thing I'm looking at, if you do that, you have got to come in the night before anyway, [illegible] if you are going to work Thursday, then you're blowing three days.

MR. OAXACA: The working session, I think perhaps, might want to have Sue [INAUDIBLE], because we really all ought to be there, and I don't think we--you know, we ought to really get everybody, because then later on they will say, ah, well I wasn't part of that.

MS. KEMNITZER: Given our schedule, we basically have to reach general consensus on our recommendations at this March meeting, so that Deborah has guidance to actually write the thing up.

DR. REYNOLDS: Well, why don't we, why don't we try then to say that.

DR. JENKINS: Let me make a suggestion. Are we saying that there are more people here now who could do the 13th and the 14th of January in California?

DR. REYNOLDS: No.

DR. JENKINS: No, oh, OK. Excuse me, I said 13th and 14th. I meant 14th and 15th, the Thursday and Friday, if we were to do that, move it to the Friday, Ann, does it help you and does it help the rest?

DR. REYNOLDS: Yeah, that would be all right with me, but I can do the March date, too, whichever is better for people. But it would have to be the 15th for me. Which is better? March.

?: Three months away--a long time from now to talk in terms of allowing this material to go unread by the majority of us.

DR. REYNOLDS: The material will get to you ahead of that. We are just talking about having a working session to formulate.

MS. KEMNITZER: Say in January, each subcommittee is supposed to bring their two-page set of recommendations, right, and we will have some time to digest and talk about them.

And then when we come together in March, we are going to really reach closure on what the group's recommendations are going to be, describe them in a fairly complete fashion so that Deborah can then write them up and that will be the final report.

DR. REYNOLDS: Could we leave the option, if worst comes to worst, especially for those of us coming from the West Coast, that the hearings might be on Tuesday, March 1st, and the work day might we Wednesday, March 2nd, would that be all right?

MS. KEMNITZER: Personally, I would feel better if we had the work session after the hearings, so that we have the appearance and the reality of having the taken the people's advice before we...

DR. REYNOLDS: All right.

MR. OAXACA: Sure.

MS. MEJIA-WALGREEN: Wednesday and Thursday, 2nd and 3rd, that's what we're talking?

DR. REYNOLDS: Yes.

DR. ADAMS: OK, let's go get it...

DR. REYNOLDS: OK, let's put that in.

MS. KEMNITZER: And we will stop the meeting at one o'clock or so.

?: On the third?

MS. KEMNITZER: So that people can get out that afternoon. And everybody has got to stay until one o'clock.

DR. ADAMS: OK, why don't you set the time, that when you put the stuff out with the minutes, so that everybody knows ahead of time.

?: Tell them til three o'clock, if you want. We arrive Tuesday night.

DR. REYNOLDS: We have to get in Tuesday night and we work on the second and the third. We go home about two o'clock on the Thursday.

DR. ADAMS: Yeah, two o'clock, say two o'clock. I had one other observation--are we finished with that piece?--two observations that I would be interested in throwing out to the committee.

One is it appeared to me that as we sit around and talk, many of us are in locations where at least the minority engineering effort is, in fact, functioning.

DR. REYNOLDS: Yes.

DR. ADAMS: I mean there is a MESA project, there is a DAPCEP, there is a PRIME. And so those of us who are unfamiliar with those as an activity, I think ought to at least put that on our calendar of things we look into. So that would be one thing I was going to suggest.

Number two, there are--and I am sorry we didn't bring it up ahead of time, but we can't do it, and so it is an afterthought.

But there are national organizations where the students function. And for some of us, for instance, we saw [INAUDIBLE] organization where there were 200 American Indian students.

So we had [INAUDIBLE] for some of us to talk with and milk those students. The next couple of times that you have a chance to do that, [INAUDIBLE] meeting in Los Angeles--it's always a January-February thing.

I don't have a date--wait a minute, I do have it with me. I'll give it to you now. It just came out because I just got it.

SEVERAL VOICES: What is SHIP, Howard?

DR. ADAMS: SHIP is the Society Hispanic--it's the 5th and 6th of February, and for those of us who [INAUDIBLE], we just might have somebody from our organization who is on the West Coast, for instance, go to that, or at least put a person for that and just look at what's going on.

MR. OAXACA: [INAUDIBLE] has asked to testify at that session. Has he called you?

MS. KEMNITZER: Yes.

MR. OAXACA: He is one of the founders.

MR. ADAMS: I am going to give you a couple of--I just thought I would throw this out, so you might, OK, NAMEPA will have its annual meeting on February the 6th, 7th, 8th in San Diego. Well, I think the thing is going to start on the 7th, 8th, 9th, and that all these people that Nate was talking about, 70 percent of them will be at that meeting.

So they will be talking about this whole plethora of things in terms of that.

MR. OAXACA: You ought to go to that, Sue. I know you don't like San Diego, but.

DR. ADAMS: On March the 17th through the 20th, the National Society of Black Engineers, which is a student, totally student-run organization, which will just blow you away, because there is no way you can understand that students could pull this off.

There will be 1,800 plus people in Washington, D.C., for four days, totally run by students. Every session--as a matter of fact, they embarrass adults, so you never want to meet where they meet, because they are so much better than we are.

But it is totally run by the students. They have banquets, they have sessions, they have politics. I mean they have caucuses where they go and lobby for who is going to run for president.

But I think that would be fascinating. You'll see 1,300 black students.

DR. REYNOLDS: But I think a little bit, Howard, and

I agree with all that, I think we have to marshall our energy and our forces a little bit, and we have to trust people like you, that know that these organizations are out there and know what they are doing.

I have every bit of faith in what you are doing and what you are saying.

DR. ADAMS: I guess the point--I'm not trying to get the committee to go, but there are people who are in Washington who--Joe, you might need to put in a day at this, just because he is the head of this committee. That is the only thing I am trying to say.

If you are working on something like this, and this hits where you are--if you look at a cultural [INAUDIBLE], for instance, there is somebody on Alan's committee who might--because NAMEPA is going to talk about that. He's got somebody on his committee.

That's what I am trying to say, I was just throwing these dates out.

DR. REYNOLDS: I think we should--the thing we have got to focus on is having the individual committees come up with their recommendations, having people with expertise, such as you, when those recommendations come forth, say, yeah, this group, this group, and that group are doing it, so they become added in and recognized as a model group.

But to say--but their real problem is they need more funding, or the real thing that need thing is more continuity, or they need more community support, or they need more parental involvement.

MR. OAXACA: [INAUDIBLE]

DR. REYNOLDS: Yeah, I think that's good. OK, other things about our functioning, meeting, logistics that you would like to bring up.

I thought the number of people testifying today was about right... [murmurs of agreement]. What are you?

MS. KEMNITZER: Well, I got a few extra gray hairs arguing with my staff to keep the number to this amount.

DR. REYNOLDS: Good, thank you. I thought that was very good. Yes, Mary.

DR. CLUTTER: There has been some concern about attrition of committee members.

DR. REYNOLDS: And we are [INAUDIBLE].

DR. CLUTTER: Yes, and I don't know whether we want to do anything about that, or whether there is anything we can do about it.

DR. REYNOLDS: Well, you know, you make a good point because I would not be a happy person, after all this work, and after all the work that all of you sitting around here have gone through if at the end we all of a sudden got interesting minority reports or refusal to endorse something by people who had simply not had the experience of the testimony.

I see you are nodding.

DR. JENKINS: Yes, I was wondering if you, maybe you should identify the attrition. Particularly find out if they are named representatives of those federal agencies. That is required by law, and if they cannot come, the agency ought to assign someone else.

DR. REYNOLDS: [INAUDIBLE] And how about a letter goes out then from perhaps Jaime and me to the chief of that agency, we noticed that your representative has not attended the following meetings, this work is very important, could you--would that be all right?

DR. DANEK: Because there are some people who, on the committee, that have never been to any of them.

DR. REYNOLDS: That's correct.

DR. DANEK: And I think that should be pointed out to the agencies.

DR. JENKINS: I can speak for one who has attended some of the meetings, who has been concerned [INAUDIBLE], and I have been begging him not to send you a letter of resignation yet, and let me work that one.

Also I think we are one of the federal agencies that [INAUDIBLE] membership, so we are probably not in the same status where there is no representation from [INAUDIBLE].

MR. OAXACA: People call in. The responsible people will call in to say that I won't be here. We know then that they are interested and just can't make it.

DR. REYNOLDS: We should be--what you are saying is we should be judicious in where we send these letters. Someone who has really tried desperately and came to the first [INAUDIBLE] show up again, we should not send them such a letter. But if we have had just noninvolvement, we should go ahead. Is that acceptable? Mary.

DR. CLUTTER: I am somewhat more concerned about industrial participation than the federal agency participation. And I know that there is a person on my subcommittee who has never attended a single hearing.

MR. OAXACA: Who is that?

MS. KEMNITZER: Beardsley.

DR. CLUTTER: Beardsley from Miles Laboratories. In fact, when my secretary called him the other day to try to set up a meeting in February, he just said that he really didn't want to be a part of the committee anymore.

DR. REYNOLDS: How did we get him?

MS. KEMNITZER: He was nominated by the Secretary of HHS.

DR. DANEK: Well, shouldn't we go back for another nomination?

DR. REYNOLDS: We should go back to the Secretary of HHS, just indicate that.

DR. DANEK: And indicate that his first nomination was not a good one. [Laughter and comments]

MS. KEMNITZER: Ask for another, we want an industrial science type, industrial research science type.

MR. OAXACA: No, you ought to start it with, this time we want a real one. [Laughter]

MS. MEJIA-WALGREEN: How much industry representation do we have on the committee?

DR. REYNOLDS: Mr. Oaxaca.

MR. OAXACA: And Mike Reyes.

?: And Cy Laughter.

DR. REYNOLDS: And Cy Laughter.

DR. ADAMS: The guy from Dayton.

SEVERAL VOICES: That's Cy.

DR. SCADDEN: I represent a trade association. That's close.

DR.REYNOLDS: Well, yes. Well, we at least ought to get substitutes for the ones that haven't come.

DR. JENKINS: There is Dr. Ruth Davis. Would she be a good one? I'm just--it's a small firm but...

MR. OAXACA: Amoretta Hoeber is with...

MS. KEMNITZER: That's right, she is with TRW.

MR. OAXACA: TRW, so she is industry, and she has been to two of these.

DR. REYNOLDS: Well, we will try to encourage those who are not coming. All right, good, any other--Deborah.

MS. SPRALLEN: Oh, just to say that I think if you are thinking about adding people late in the process, you could be asking--you could be introducing someone who had not been exposed to all of this and who would harder to bring up to speed.

You would have to be sure that the person was maybe already introduced to the issue and you didn't have to start all over again. I mean, I think the earlier question you raised about people who hadn't been exposed to the hearings could be an issue later on.

DR. REYNOLDS: It is a good point.

DR. JENKINS: Except we now have marvelous minutes from those hearings which I think would be invaluable.

MS. SPRALLEN: But I don't think the minutes are as effective as the extent of the real human drama.

DR. REYNOLDS: Like the young lady from Springfield, Missouri.

[Several comments of agreement.]

DR. DANEK: But I also think it depends, too, on how badly we need the agency. For example, we need OMB, and we haven't had OMB here. If we are going to be successful, we need OMB's participation.

We don't need somebody from an agency that may not have as much involvement with these programs, so I think that's another factor.

DR. REYNOLDS: We have to really think about it.

DR. DANEK: We have to have somebody from OMB participating very strongly.

MR. OAXACA: Did Department of Labor accept?

MS. KEMNITZER: Not formally, yet. They have read me four different versions of the letter over the telephone, but apparently haven't gotten it through the system to sign somehow.

I only expect that the answer will be yes, but it hasn't gone through the chain of command. To give them some credit, their chain of command has changed since we started down the road.

DR. DANEK: Could I ask another question. This Task Force started out as an OSTP task force.

MS. KEMNITZER: No, it did not.

DR. DANEK: It did not?

MS. KEMNITZER: No.

DR. DANEK: Do we have any authorization from any group within the government other than--this is not a White House Task Force, this is not an OSTP task force.

MS. KEMNITZER: OSTP, by law, has to call the first meeting.

DR. REYNOLDS: And they did.

MS. KEMNITZER: And they did.

DR. DANEK: And that was the extent of the...

MS. KEMNITZER: Now, as well we report our results to the head of each participating agency, and to the President and to the Congress.

And as I understand it, in the White House apparatus, the President has delegated to Dr. Graham, the head of OSTP, responsibility for the presidential-level actions.

Yes, they are definitely involved, but it is not an

OSTP activity. We are just off there by ourselves, with this conglomerate.

DR. REYNOLDS: [INAUDIBLE] discretion to the hindmost, OSTP has not been helpful.

DR. DANEK: That's what I was driving at.

DR. REYNOLDS: You want to know if they have, you know, we tried to get some help, and they [INAUDIBLE].

DR. DANEK: If they are not willing to help, is it just negligence or just.

MS. KEMNITZER: Things move very, very slowly.

DR. DANEK: Is that what it is?

MS. KEMNITZER: Yeah.

DR. DANEK: Or is it really lack of concern.

MS. KEMNITZER: I don't--I think Dr. Graham is genuinely concerned, personally, about this.

DR. DANEK: There are a few critical agencies [INAUDIBLE].

DR. REYNOLDS: But we have asked him, for example, a call from him to Governor Deukmejian would have sent Deukmejian to this thing, and we could never get him to do it.

DR. DANEK: Did you talk to him personally?

DR. REYNOLDS: Sue did.

MS. KEMNITZER: I sent him talking points, and trying to make the phone call and draft letters and they declined.

DR. JENKINS: You did not pick up the phone and talk to him?

MR. OAXACA: You should have let me know. I would have called him. I will still call him.

DR. REYNOLDS: Why don't you call him, please do, because we tried fervently to get them to get him to do it.

DR. JENKINS: I was going to suggest just in case you cannot get an industry person to join at this late date, we might think of who are some key people who we can at least run our ideas by, or at least have them come talk with us when we are ready to make the suggestions.

And there would be somebody from the Conference Board, whoever has been looking at this issue, in terms of the future work force.

And another would be the people who put out the report. It is blue and I don't remember the exact name, but it was a consortium of industry people saying what needed to be changed about our school systems, that we are going to have a well-educated society and...

MS. KEMNITZER: There are two solid ones that have come in. The Committee for Economic Development put out a [INAUDIBLE] recently, and also the National Governors Association.

DR. JENKINS: Help with the [INAUDIBLE], are those resources that have gone through this, and have recommendations out on the street.

MS. KEMNITZER: You know, Peter Cannon of Rockwell, head of the White House Initiative on Historical Black

Colleges. He would be an excellent person, and a very...

[Comments of approval]

DR. DANEK: See, that was better linkages between this group and other groups. The other thing I was wondering about was, was it Time magazine or People magazine which had an article recently.

DR. REYNOLDS: There is a little difference between those two.

DR. DANEK: They are produced by the same, and Money magazine. But it was Time or People had an article about five or six or seven people who were millionaires, who had made, businessmen who decided to go back and adopt 20 or 30 kids and put them through college on their expenses.

And it was a marvelous article, because what happened...

DR. REYNOLDS: That's the man in New York City--People magazine.

DR. DANEK: There were a couple people and it spread, and it might be interesting to get one or two of those people if we could.

DR. ADAMS: I was going to--another person I was going to ask--what is this thing that President Rhodes from Cornell is doing? His committee is looking at something, his group is doing something similar to what we are doing, and it might well be that we might wonder what he came to, like the Baltimore one, and talk about what his initiative is about.

DR. REYNOLDS: Well, there is the issue, though, all of us in higher education have enormous outreach programs. I could inundate this committee with stuff that we are doing in California.

I think our real issue is to, for this group to come up with an overview of what we think ought to be done, and let the chips fall where they may.

I don't think you really want to hear what every little institution is saying.

DR. ADAMS: I can't remember the commission. He is head of commission. He is head of some commission, so it is not a school.

MS. KEMNITZER: Yes, at One Dupont Circle, the education [INAUDIBLE], but it is not impressive. They haven't done anything yet.

[Several comments at the same time.]

DR. JENKINS: How about this one university, either in North Carolina or South Carolina. It is the only one where minorities are succeeding. They have the highest percent of graduates in science and engineering.

DR. DANEK: A North Carolina school.

DR. ADAMS: University of South Carolina.

DR. JENKINS: The university is supposed to have the most successful program for minorities in America. That's what I heard.

DR. REYNOLDS: But there we come again to the show and tell thing from universities. I have even avoided putting you all through that. I don't think you really, that's not what we really.

DR. JENKINS: If they were going to identify what it is they do, the cause of success, and if they are willing to even send a paper to the group, it seems to me that would be helpful.

DR. REYNOLDS: But they all, my point, now I will be on the line, I am going to be very frank.

There are lots of institutions that claim they are really doing this or really doing that, and the programs are remarkably similar. They are, you know, tracking youngsters early, identifying them, providing mentors and so forth.

We have heard a great number of them in the hearings. We could get enormous numbers of those from higher education institutions, and if that is the way the whole group wants to go, we can have dozens of people trot in and talk about those programs.

But I actually think the way the group has gone is more affective. The MESA program, for example, involves many institutions and is aimed at lifting minorities up into engineering.

And it is--and we have heard about it in several--we have heard about it and its sister programs, generic programs nationwide.

Mr. Hill has a really good grasp of that. I guess I want to push this group towards overwhelming recommendations for what need to be done in the future in the research area, the educational area, and so forth.

DR. DANEK: And isn't it true that one of the biggest problems you have is that people or institutions have done things and they are all doing things, they are not linked together, coordinated, and it is not done to the point where it comes up on a statewide level where there is a real concern.

Is that--where there is something that can be done on a kind of a statewide level, which could raise the consciousness.

DR. REYNOLDS: I need Nina Winkler here now to help me out. Our higher education system in the United States is terribly diverse, and everybody wants it to be that way, and I guess I do to.

It comes from a variety of state support, it comes from a variety of different ways, some of it private support, state support, different states like New York, helped the private institutions and so forth.

And so there is a variety of mechanisms. I think to think in this nation about one way to have every institution to go about something would mandate this group to failure.

I am just giving you a personal opinion, is the higher education--on the other hand, if this group were to come out very strongly behind, it is critical that youngsters in K through 6 have mathematics instruction and the mathematics instruction would be at such and such a level, that will have impact.

If we say there should be a nationwide czar for mathematics instruction, K through 6, we're doomed. That's all I'm trying to say. Forgive me if I am being too...

MR. FERNANDEZ: From a policy standpoint, though, going back to the question you raised, Sue, the governors, National Governors Association [INAUDIBLE] report zeroed very strongly at the at-risk students.

And there's all kinds of spinoffs coming off of that now throughout the states.

The other one, Peter Cannon, for years and years he has been at it now. The economic impact of not educating the total populace, and the marginal loss on the economic [INAUDIBLE].

We have got to get some group or some attention from the private sector to really come in very, very strongly and see that in conjunction with our recommendations.

DR. REYNOLDS: You make a very important point. To take it a step further, that is an important policy decision from this group. Right now, in the United States about half of all high school graduates go on to college.

In the United States we have treasured the notion of a lot of people going on to higher education. Now, we have high attrition rates, but we have treasured the notion of opportunity.

That is a real question I think this group has got to grapple with in the education part, and industry has to tell us.

Now, generally if you talk to industry they want more higher education trained people in this nation, but that is just exactly the kind of thing that we are all about and that needs to come out of that education subcommittee in some way, shape or form.

MR. FERNANDEZ: Yeah, the thing that the guy from Ford Company said today, if you could get that blasted through the Midwest, you know, in conjunction with the Task Force activities and recommendations...

DR. DANEK: You've got to work at both ends. You can work at the national agenda with the politicians, but unless you get, in my view, unless you get into the states, into the leadership of the universities and in the state government, political leaders at the state level and work that, you are not going to be successful.

DR. REYNOLDS: What this group does could be helpful, and this is just talking again as a person trying to work in higher ed in California. The recent Askew Report, that Terrell Bell chaired the commission, "To Secure the Blessings of Liberty."

It pointed out that only 18 percent of all Americans currently have four years of college. That is not a baccalaureate degree, but went for four years.

But what the nation really needs is at least twice that many people with a baccalaureate degree.

Now that's helpful. I use that all the time now with the legislature who nod and find that a reasonable goal, and reasonable data to work with.

If we come up with the future research establishment, the future aerospace industry, needs the following kinds of people, that the following pools need to be enhanced, and that we make this recommendation in order to achieve that, women, minorities, and the handicapped have got to come along, and the real blockage there is in K through 4 and the following has to be done.

Then I think we have got a real opportunity to move it in this nation. But coming from that point of VIEW buttressed by data in that fashion.

Those are just for instances. We may not come out with that kind of recommendation at all. But putting together what all you are saying is how we need to move.

That's why we need more manpower information.

DR. JENKINS: One of the things--I know, myself, there have been several national studies made with recommendations. Do you feel that we are aware of those? Enough aware of what has been recommended, just within the last year or two, to know what relevance it has for our subcommittees, whether it is "The Nation at Risk," or "Programs That Work" or anything else.

I'm sorry Winkler isn't here because one of the things you heard referred to this morning is the legislation for economic education or something--there are monies, there are federal funds, supposedly, to improve the teaching of math and science.

MS. KEMNITZER: I know that the--I have given all that material to the education committee. I'm happy to send a set to you.

DR. JENKINS: Well, I'm sure that we are on top of existing legislation, what supports there are out there, what is being required and where the nation is going.

So when we make our recommendations we [INAUDIBLE].

DR. REYNOLDS: Yeah, I think that's critical. We would be silly, we would look silly unaware, if we came out with something that had been either strongly recommended by some other group in exactly the same fashion, or we were naive in our data or something.

DR. DANEK: You know, Ann, I think that is a good suggestion. I feel like I am working in a vacuum. I think I know half of what is happening here and two pieces of that, and all of a sudden Howard comes up with another activity that is taking place somewhere that he knew about all along.

It seems to me it would be very helpful if each committee member would put down on one single sheet of paper what they know to be going on in this whole area, that is, maybe...

DR. REYNOLDS: That's what our hope is.

DR. DANEK: I mean what they know as individuals and get them to the right committees before we start writing things.

DR. REYNOLDS: Do you want to suggest that as kind of an appendix to what you are coming in with? I think we really need to move back into our committee structure and get the committee recommendations coming in as a whole, and that kind of addition would be very helpful.

DR. DANEK: It would be helpful to me, because if you put down what you knew to be going on in research and activities, and we put down a list of--for example, if we put down a list of all the organizations that are working on this problem, that to me I would have some kind of better understanding, I think, of what's happening.

DR. JENKINS: I was hoping that someone would do that centrally, just have the list of recommendations for the improvement of teachers, "The Nation at Risk," the industry group, the economic development one.

I have never seen an amalgamation of all of those recommendations that come from all of those groups, but in fact...

DR. REYNOLDS: Do you know that there are over 100 studies since "Nation at Risk"?

MS. KEMNITZER: That's why I'm being silent.

[Several people speaking at once.]

DR. JENKINS: That's exactly what we're talking about.

DR. REYNOLDS: But that's why all these people with this level of expertise are on this committee. Everyone around here has in their mental armament, just like our good friend here, Dr. Adams, heading out the door, knows all of the engineering programs and so forth.

So we are going to have to depend on that mental computer lode of those things.

DR. JENKINS: Or maybe we can ask people to do it for us.

DR. DANEK: Howard, he is going to it for it.

DR. JENKINS: Howard, [INAUDIBLE] who spoke to us and who will probably be very, very familiar with a number of studies.

DR. REYNOLDS: Deborah has something she is eager to say.

MS. SPRALLEN: No, actually, you have a better solution than I. I was going to make, ask, you know, in the office we have most of these reports, right?

MS. KEMNITZER: We have a huge collection of them.

MS. SPRALLEN: And I have been sporadically going through them. Would it be useful for, well before the March meeting, to simply to xerox the recommendation pages and the title pages of some of these major reports.

MS. KEMNITZER: I have sent many of the major ones to the task force.

MS. SPRALLEN: OK, I was just saying that possibly.

MS. KEMNITZER: If you sat down and read the National Science Board report, "Educating Americans for the Twenty-First Century," you would get 90 percent of it.

DR. REYNOLDS: OK, it looks like we are dissolving to head for the airport. Any last comments? OK.

May all of you have a wonderful Christmas, holiday, and we will see you in California in January.